Rock Products

TRADEPRESS PUBLISHING CORPORATION
542 SOUTH DEARBORN STREET
CHICAGO

NATHAN C. ROCKWOOD, Editor CHAS. H. FULLER, Manager C. F. TREFZ, Associate Editor

Vol. XXIII, No. 7 March 27, 1920

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Table of Contents

Recent Addition to Pittsburgh's Fleet of Sand Dredges 19
Small Sand and Gravel Plant 20
Meramec River Sand and Gravel Plant Operation 21, 22
New Rochester, N. Y., Quarry Company 22
New Iowa Quarry Operation 23
Hints and Helps for Plant Superintendent 24, 25
Value of Quarry and Plant By-Products as Fertilizers 26
Railway Ballast Outlook Good 27, 28, 29, 30
Modernizing a Cement Plant 31, 32, 33, 34, 35, 36
Employers Getting Closer to Men 37
Utilization of Waste Granite 38
Important U. S. Court Decision on Trade Association Practices 38
Labor-Saving in Sand-Lime Brick Plant 39
Famous Massachusetts Lime Plant 40, 41, 42, 43, 44, 45, 46
Editorial Page 47
Labor-Saving in the Rock Products Industry 48, 49
Union Labor Squabbles Threaten Construction Program in East 50
New Equipment and Machinery 51
Current Prices of Rock Products 52, 53, 54
General News of the Rock Products Markets 55, 56
Passed by the Screens 57, 58

ALPHABETICAL LIST OF ADVERTISERS

Advance Engineering Co., The 63
Aero Pulverizer Co. 76
Aetna Explosives Co. 14
Allen Cone Co. 9
Allis-Chalmers Mfg. Co. 78
Allied Belting Co. 67
American Crane & Eng. Co. 62
American Hoist & Derrick Co. 10
American Process Co. ..... Inside front cover
American Pulverizer Co. 72
American Steel & Wire Co. 61
American Well Works 64
Atlas Car & Mfg. Co. 65
Austin Mfg. Co. ..... Inside back cover

Baldwin Locomotive Works 62
Ball Engine Co. 69
Bates Valve Bag Co. 80
Beaumont Mfg. Co. 62
Bradley Pulverizer Co. 83
Browning Co., The 62
Buchanan Co., C. G. 79
Buckbee, J. C., Co. 63
Butterworth & Lowe 67
Byers Machine Co., John F. 79

Cable Excavator Co. 62
Central Frog & Switch Co. 61
Chalmers & Williams 15
Chapman Eng. Co. 78
Chicago Perforating Co. 62
Cincinnati Rubber Co. 77
Classified Advertising 60
Classified Business Directory 82
Cross Eng. Co. 66

Du Pont de Nemours & Co., E. I. 12
Duplex Truck Co. 8

Easton Car & Construction Co. 62
Ehrsam & Sons Co., J. B. 63
Ensign-Bickford Co. 71
Erie Steam Shovel Co. 69

Fate-Root-Heath Co. 18
Fuller Engineering Co. 63
Fuller-Lehigh Co. 71

Gifford-Wood Co. 71
Glamorgan Pipe & Fdy. Co. 3
Goodyear Tire & Rubber Co., The 5
Good Roads Machinery Co. 13
Green, L. P. 81
Gruendler Pat. Crusher & Pulv. Co. ..... Inside front cover

Hendrick Mfg. Co. 64
Hettrick Mfg. Co. 70
Hunt, R. W. & Co. 63

International Clay Machy. Co. 70

Jaite Co., The ..... Inside front cover
Jeffrey Mfg. Co., The 16
Johnston & Chapman 69

K-B Pulverizer Co., Inc. 66
K. C. Hay Press & Tractor Co. 77
Kennedy Van Saun Mfg. & Eng. Corp. 11
Kent Mill Co. 74

Leschen & Sons Rope Co., A. ..... Inside back cover
Lewistown Fdy. & Mach. Co. 61
Lima Locomotive Works 73
Link-Belt Co. ..... Back cover

Marathon Mill & Machy. Wks. 81
Mayer-Hasseldiek Mfg. Co. 61
McAuliffe, Pierce J. 63
McLanahan-Stone Machine Co. 64
McMyler Interstate Co. 70
Mining Mach. Co. ..... Inside back cover
Miscampbell, H. 80
Morris Machine Works 74

National Engineering Co. 70
New Jersey Wire Cloth Co. 69
New York Belting & Packing Co. 1
Nortmann-Duffke Co. 61

Ohio Locomotive Crane Co. 69
Osgood Co., The 65
Owen Bucket Co. 72

Pennsylvania Crusher Co. ..... Inside front cover
Porter Co., H. K. 61

Raymond Bros., Impact Pulv. Co. 6
Robins Conveying Belt Co. 61
Ruggles Coles Eng. Co. ..... Inside front cover

Sanderson Cyclone Drill Co. 68
Sauerman Bros. 62
Schaffer Eng. & Equip. Co. 75
Smidth, F. L., & Co. 63
Smith Eng. Works 4
Steacy-Schmidt Mfg. Co. ..... Inside front cover
Stephens-Adamson Mfg. Co. 83
Stimpson Equip. Co. 73
Sturtevant Mill Co. 17

Track Equipment Co. 68
Traylor Eng. & Mfg. Co. 76

United States Chain & Forging Co. 65
Universal Crusher Co. 68
Universal Road Mach. Co. 64
Used Equipment 59-60
U. S. Rubber Co. ..... Front cover

Vulcan Iron Works 68

Watt Mining Car Wheel Co. 67
Webb City & Carterville Foundry & Machine Works 65
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Whitcomb Co., Geo. D. 7
Williams, C. K. & Co. 61
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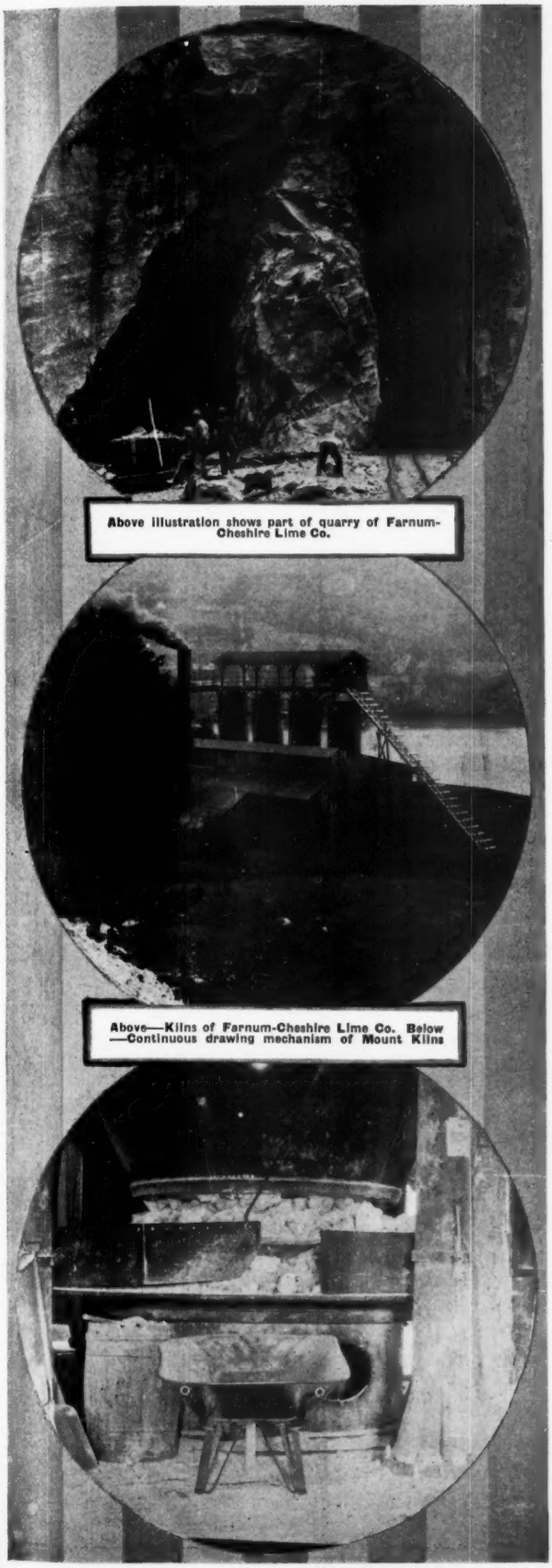


Above illustration shows part of quarry of Farnum-Cheshire Lime Co.

Above—Kilns of Farnum-Cheshire Lime Co. Below—Continuous drawing mechanism of Mount Kilns

Manufacturer of Lime

Desiring to Improve and Increase Their Output

will find the means for accomplishing these results provided by the

MOUNT

Continuous-Discharge GAS-FIRED KILN

Four of these kilns have been in constant service at the plant of the FARNUM-CHESHIRE LIME CO., FARNUM, MASS., for a period of six years and have given excellent results in

Economy of Operation

Capacity and Quality of Product

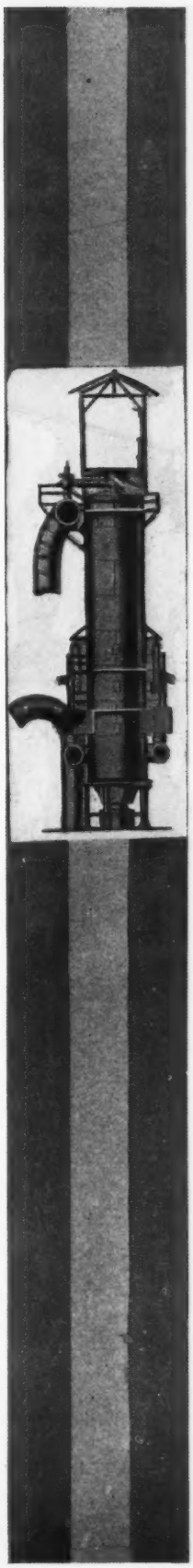
The principal characteristics of the design of these kilns is a careful balancing of parts for the specific purpose of close chemical control, without which continuity of operation, uniformity in quality and quantity of product, and the highest efficiency and economy are impossible.

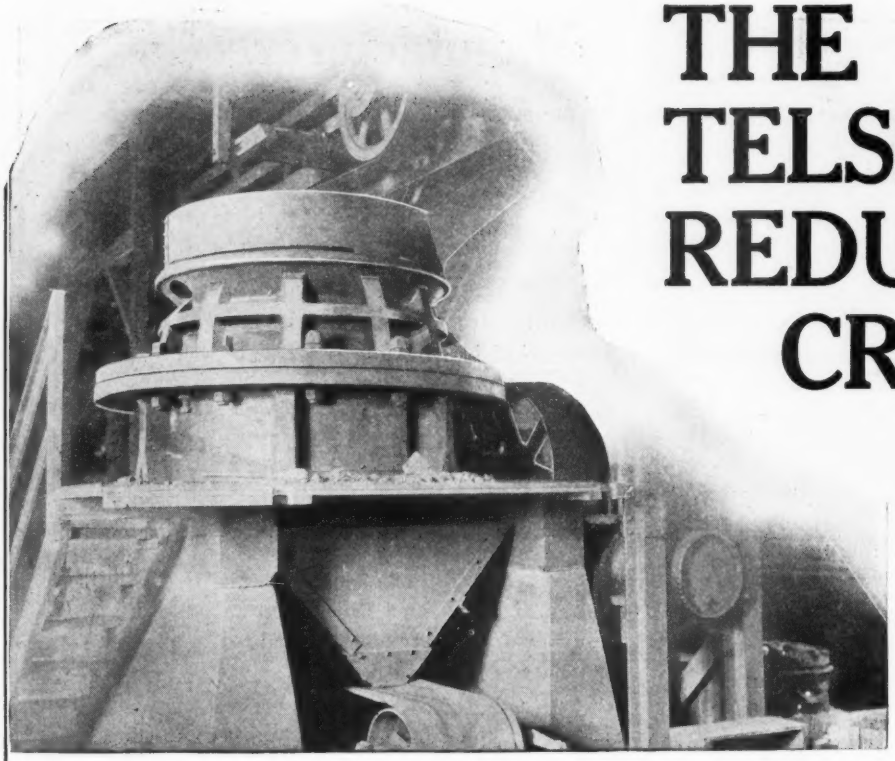
Temperature Control Is Definite at ALL Times

Prevention of Over-Burning Is Assured

An interesting booklet on the subject of "Lime from a Gas-Fired Continuous Kiln," in which are presented important principles in kiln operation and their application, will be sent to you on request. Investigate. Send for this booklet today.

GLAMORGAN
PIPE & FOUNDRY CO.
Sole Manufacturers
Lynchburg, Virginia





THE TELSMITH REDUCTION CRUSHER

An Ideal Re-Crusher

The Telsmith Reduction Crusher, as pictured above, is a short, heavy gyratory crusher of the pillar-shaft type, specially designed for crushing to ½ in., ¾ in., 1 in. and 1½ in. sizes. Its main advantages are—

(1) Compact, sturdy structure—requires little head room—seldom damaged by tramp iron.

(2) Enormous discharge circle, assuring big capacity and free clearance of finished product, even when set up close for fine crushing.

(3) Rigid bolt shaft—guaranteed unbreakable.

(4) Long sleeve eccentric with renewable babbitt sleeves.

(5) Big open crushing hopper, allowing free, unassisted gravity feed. No choking, even with a twenty-foot head of rock over the machine.

(6) Gravity discharge from base of crusher, with no centrifugal action and only slight wear on bottom spider.

(7) A big reduction ratio. The No. 4 Reduction Crusher will take No. 7½, 8 or 9 crusher-run without screening and finish to ¾"-1½" size.

(8) Last (and most important), this crusher is free from complications, sturdy in build, with very little fly-wheel effect. Tramp iron will seldom damage it. It's the kind of a machine that the experienced master mechanic enjoys running. Glad to send you Bulletin 2-F-11, covering Telsmith Reduction Crushers or our catalog 166 describing Telsmith Primary Breakers.

SMITH ENGINEERING WORKS

3188 Locust Street, Milwaukee, Wis.

Old Colony Bldg. Chicago, Ill.	930 Oliver Bldg. Boston, Mass.	203 Brunson Bldg. Columbus, Ohio	Franklin and Channing Aves. St. Louis, Mo.	625 Market St. San Francisco, Calif.
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Hose as Efficient as Your Best Air Tools

Whether the working pressure is the even power behind a planer or the pulsating force that drives a riveter, Goodyear Monterey Pneumatic Tool Hose holds the air with equal strength.

Designed and built to work as a part of the tool, Goodyear Monterey Pneumatic Tool Hose will not kink, crack or burst. It resists the rotting action of oil that finds its way into the air line, and it withstands the abrasion that is a part of every construction job.

Besides its strength, this hose has the qualities that favor good workmanship. The operator finds it is light and easily handled. He appreciates its flexibility whenever he has to work in awkward corners.

The dependable efficiency of Goodyear Monterey Pneumatic Tool Hose is maintained throughout an operating life much longer than that of ordinary hose.

Strong, light and flexible, Goodyear Monterey Pneumatic Tool Hose reflects in its working economy the care with which it is Goodyear-built to serve you and to protect our good name.

For further information about Goodyear Hose, write to The Goodyear Tire & Rubber Co., Akron, Ohio

GOODYEAR

PNEUMATIC TOOL HOSE

Pulverizing Barytes

For the Paint and Rubber Trade

TEST Final ~~Preliminary~~

Duration of Test SEVEN HOURS Methods Used WEIGHED MATERIAL

Material Fed	Size	Temperature	Moisture
	3/4"	COLD	DRY

Remarks: FEED VERY SATISFACTORY

Fineness		
	10 Mesh	%
	Mesh	%
	Mesh	%
	100 Mesh	%
	200 Mesh	%

Capacity per hour 3000# Power Mill 20 H.P. Fan 15 H.P.

Remarks:

Fineness		
	10 Mesh	%
	Mesh	%
	Mesh	%
	100 Mesh	%
	200 Mesh	TRACE %
	Mesh	%

Changes to be made SUGGESTED STILL LOWER MILL SPEED TO REDUCE VIBRATION TO A MINIMUM

This test supersedes TEST OF OCT. 30-1919

This test followed by

Signed WM B. SENSEMAN

The accompanying test illustrates what a Raymond Two Roller Mill is doing in the **dry** grinding of Barytes, producing a product which equals the water floated variety.

Notice particularly length of test, capacity, power used and the fineness.

A trace on a 200 mesh test sieve means that only a few particles remained on the screen and they amounted to so little that they could not be weighed accurately.

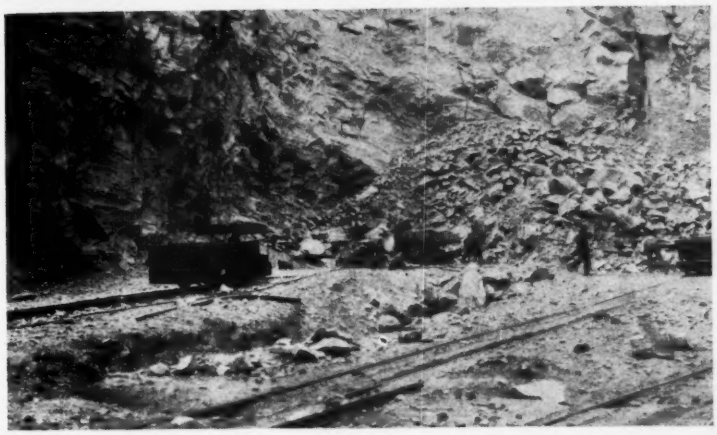
The grinding of Barytes is only one of the many fine grinding problems handled by the Raymond System.

Your requirements of fineness can be met by a Raymond Mill with air-separation, and we will be glad to give full particulars if you will submit details.

Raymond Bros. Impact Pulverizer Company

Western Office:
201 Boston Bldg., Denver, Colo.

1301 North Branch Street, Chicago, Ill.



For Your Quarry Hauling

A Whitcomb Gasoline Locomotive in service at the plant of the Farnum Cheshire Lime Company, Farnum, Mass.

STORAGE BATTERY LOCOMOTIVES—1 TO 8 TONS ON DRIVE WHEELS

WHITCOMB LOCOMOTIVES
THERE'S ONE FOR YOUR WORK

GEAR AND FRICTION DRIVEN GASOLINE LOCOMOTIVES—2½ TO 25 TONS ON DRIVE WHEEL

6 TON 3 SPEED GASOLINE LOCOMOTIVE

Two of these locomotives are in use at this plant—push 6 loaded cars up grade—switch the cars on a fan shaped track layout in the quarry and collect strings of six loaded cars.

Whitcomb Locomotives invariably render satisfactory service in the rock products industry. *It will pay you to get our proposition before you buy.*

Geo. D. Whitcomb Co.
Main Office and Works
Rochelle, Illinois, U. S. A.

DUPLEX TRUCKS

BUILT FOR BUSINESS

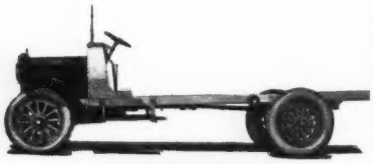
Why the Duplex Limited Is Winning Enthusiastic Approval All Over America

WITHOUT question the remarkable success of the Duplex Limited is due to the confidence that truck users all over America have in the Duplex Truck Company as builders of trucks that a business man can consider an investment in practical trucking efficiency.

The Limited is designed and built by a company that is known to be successful—a company that is famous for building good trucks.

Medium Capacity—Two-Wheel Drive—Complete Electrical Equipment—Pneumatic Tired—High Speed—it is a wonderful truck for general business hauling.

Four Cylinder, enclosed type motor—water cooled—cast enbloc—Bore 4". Stroke 5¼". 3 Point Suspension. Pneumatic Cord tires. 145" Wheel Base. Electric Lighting and Starting. Equipped with Windshield, Ammeter; Boyce Motometer; Speedometer; Electric Horn; Tools; Jacks; Rim Wrench; Front Fenders; Alemite High Pressure Lubricating System; Driver's Seat without extra charge.



DUPLEX BUILT FOR BUSINESS

Experience Has Found No Equal to the Duplex 4-Wheel Drive in the Hauling of Stone, Sand and Cement

THERE is just one answer to the universal preference you find for the Duplex 4-Wheel Drive wherever there are heavy deadweight loads to be hauled.

And that is the "All-Wheel" pull of the Duplex 4-Wheel Drive—plus the fact that Duplex trucks have been especially designed to transport deadweight loads under conditions that are ordinarily beyond the capacity of any other kind of motor trucks.

The drawbar pull of the Duplex 4-Wheel drive is 4 times that of the other trucks, because it exerts double the leverage.

Instead of the rear wheels pushing the load with its inertia of dead weight and passive front wheels, every wheel on the Duplex exerts its power and carries its proportion of the load as long as front or rear wheels get traction.

Because every wheel works all the way in level going to overcome the inertia of dead weight, Duplex hauls more economically on every road—be it grade or level.

The front wheels of the Duplex 4-Wheel Drive pull while the rear wheels push. The result is minimum wastage of power and maximum dependability in delivering the load.

Business is coming more and more to deal with certainties and not impressions in motor transportation. And the stronger this viewpoint obtains, the more apparent becomes the superiority of the Duplex 4-Wheel Drive.

The facts of Duplex double leverage and four-fold pulling power are in the hands of every Duplex dealer. You will find they will convince you beyond dispute as to the advantages of Duplex 4-Wheel Drive for hauling stone or gravel, sand, and cement, and other loads of similar character.

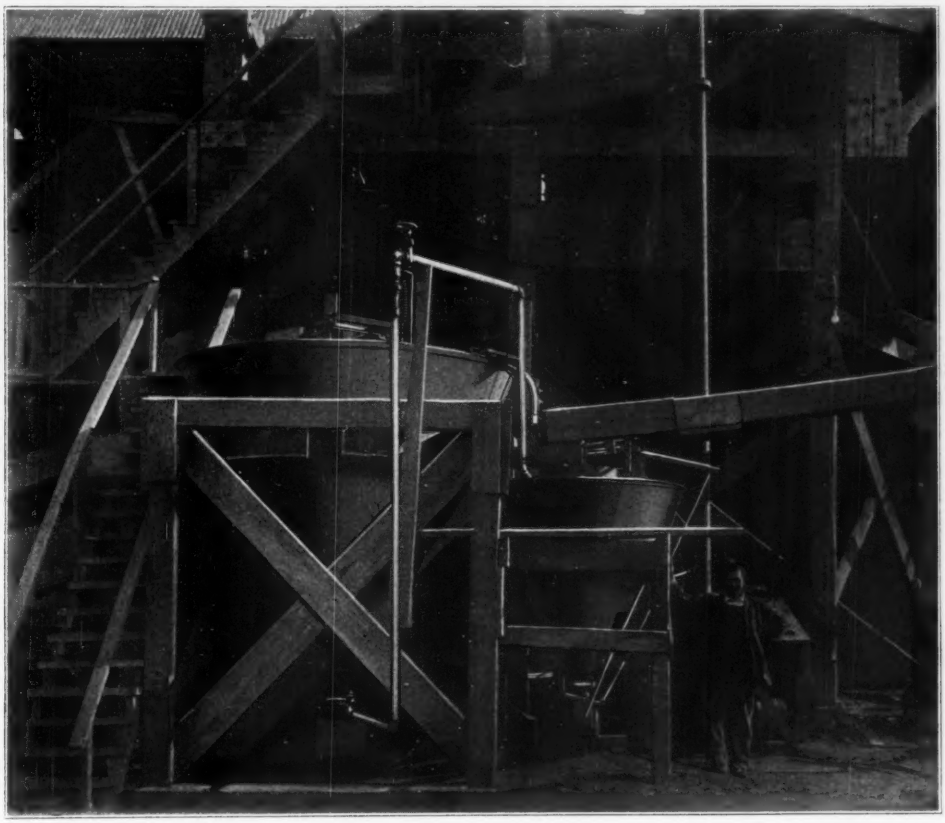
Duplex Truck Company

Lansing • Michigan

One of the Oldest and Most Successful Truck Companies in America

THE ALLEN SAND WASHING CONE

A New Device for Recovering and Washing Sands, Especially Useful in the Recovery of Fine Sands



Allen Sand Washing Cone with Allen Sand Cone Settling, Washing and Dewatering Fine Phosphate Sands

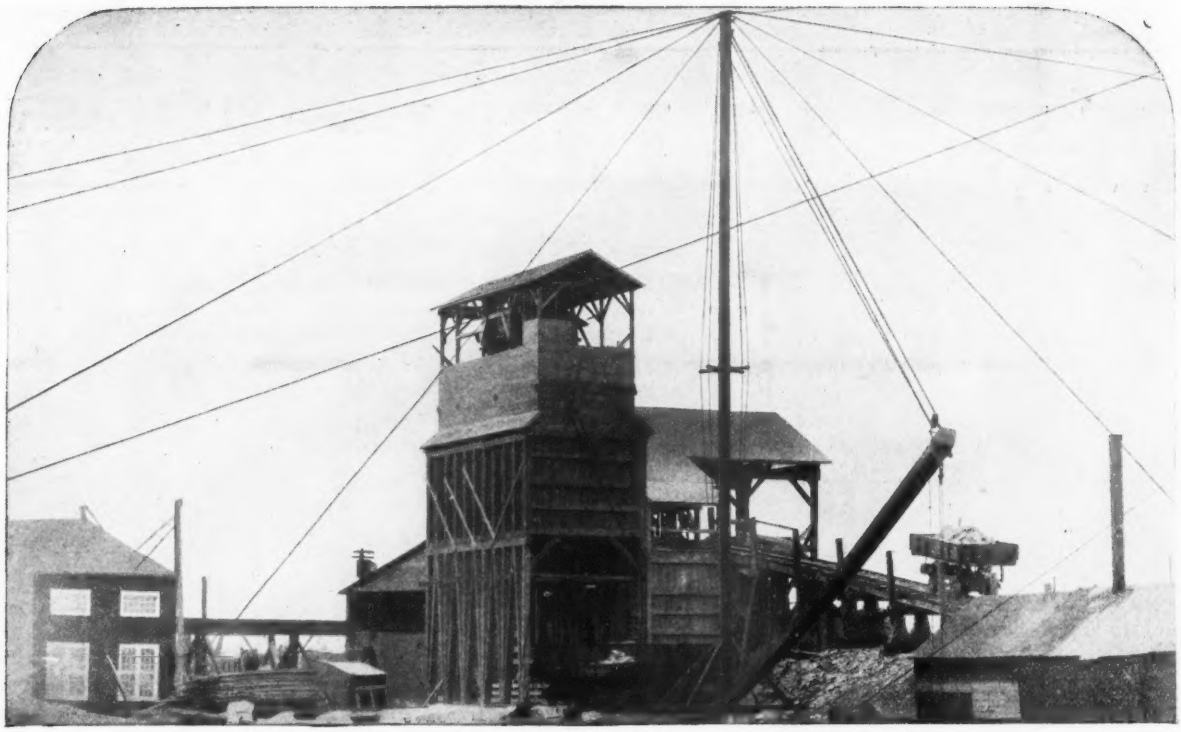
Automatic Control — No Power Required
Constant and Regular Results

Has a LARGE SETTLING AREA in which the sands accumulate and pass to a Water Chamber where they are rinsed in Clear Water and delivered to an Allen Sand Cone for final washing and dewatering.

May be used to separate ANY sandy or granular material from clayey or slimy matter. In use in some of the largest plants in the Tennessee Phosphate Field.

Fully Described in Bulletin No. 12 of

THE ALLEN CONE COMPANY, Engineers
BOX 299 EL PASO, TEXAS



Famous St. Cloud Granite Quarries almost 100 percent "AMERICAN" equipped

THE famous St. Cloud Granite Quarries are almost 100 per cent "AMERICAN" equipped with handling machinery. "AMERICAN" Derricks operated by "AMERICAN" Steam Hoists lift out the great blocks of wonderful gray and red granite, shift it about in the finishing yards, and finally load the finished product onto the cars for shipment all over the United States.

In the development of the St. Cloud granite field "AMERICAN" machinery has played an important part. From the start the quarrymen have had the best rock handling equipment obtainable.

"AMERICAN" Quarry Machinery has the strength and speed requisite for maintaining a large and consistent output, and the ruggedness to withstand hard usage and constant exposure to extreme climatic changes.

Tell us your problem. We are sure we can help you solve it.

No matter where you are, an "AMERICAN" representative can reach you in twenty-four hours.

"Give me where I may stand and I will move the world."

American Hoist & Derrick Co.

Saint Paul Minnesota

Builders of "AMERICAN"

Hoisting Engines	Locomotive Cranes	Sugar Cane Machinery
Electric Hoists	Railroad Ditchers	Marine Deck Machinery and Tackle
Derricks	Logging Equipment	The Genuine "CROSBY" Wire Rope Clip

New York Chicago Pittsburgh Seattle New Orleans Detroit

AMERICAN
HOIST & DERRICK CO.

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Strength—Terrific Strength

This is the big, outstanding feature of the

Kennedy Gyratory Crushers

They verify in actual performance the years of exacting attention which we have given to every part of their construction to insure maximum toughness of every wearing part.

KENNEDYS do a greater amount of work, crushing the same kind of rock or ore with the greatest speed and with less strain than any other type. This fact is due to the self-aligning eccentric.

All materials, such as iron, steel, zinc and babbitt metal are selected to suit the particular work for which they are intended. They are subjected previously to chemical and physical tests to insure the highest degree of efficiency. All parts are made to gauge and template to insure interchangeability. By this method spare parts will fit as accurately as those originally composing the completed machine.

Send for full description. Send us information on your crushing project and we will gladly make an estimate.

Kennedy Van Saun Mfg. & Eng. Corp.
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Licensed Manufacturers for Great Britain and Colonies

DU PONT

Blasting Accessories
—*for Better Blasting*

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ELECTRIC BLASTING CAPS
DELAY ELECTRIC BLASTING CAPS
FUSE
BLASTING MACHINES
DELAY ELECTRIC IGNITERS
GALVANOMETERS
RHEOSTATS
LEADING WIRES
CAP CRIMPERS
TAMPING BAGS
THAWING KETTLES

THE success of any blasting operation is largely dependent upon the detonating materials used. Be sure the Du Pont Label is on your Blasting Accessories as well as on the explosive container itself and you know you are right.

118 years of manufacturing and research in the field of explosives has enabled the Du Pont Company to develop the most efficient and most economical accessories for putting them to work.

Write today for our booklet, "Blasting Accessories." Every user of explosives needs a copy.

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Sales Dept.: Explosives Division
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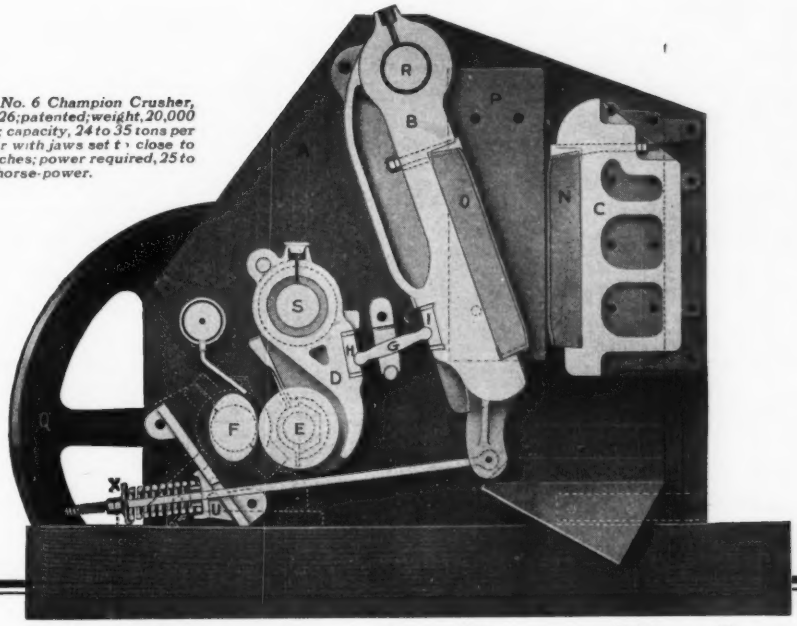

No. 6 Champion Crusher, 12x26; patented; weight, 20,000 lbs.; capacity, 24 to 35 tons per hour with jaws set t› close to 2 inches; power required, 25 to 30 horse-power.

A Champion for Every Need

There is a Champion Rock Crusher for every kind of work. From this table you can select the Champion best fitting your needs.

Class Name	Size of Jaw Opening	Jaws Set to Close	Capacity in Tons Per Hour	H. P. of Engine Required	Size of Driving Pulley	Rev. per Min.	Floor Space Required	Extreme Height of Machine	Weight
	inches	inches			inches		ft. in. ft. in.	ft. in.	
3	7½ x 13	2	8 to 12	12	38x 8	170	4-6x5-6	4-7	5500
4	9x15	2	12 to 18	15	48x 9	155	5-6x6-6	5-9	8800
4½	10x20	2	16 to 24	18	50x10	150	7-0x7-0	6-1	12500
6	12x26	2	24 to 35	25	60x 9½	140	6-6x8-6	6-2	20000
6A	13x26	2½	26 to 38	25	60x 9½	140	6-6x8-7	6-2	20075
6B	14x26	3	30 to 45	25	60x 9½	140	6-6x8-8	6-2	20150
6C	15x26	3½	35 to 50	25	60x 9½	140	6-6x8-9	6-2	20225
66	12x26	2	48 to 70	50	60x 9½	140	6-6x15-11	6-2	37050
66A	13x26	2½	52 to 76	50	60x 9½	140	6-6x16-1	6-2	37200
66B	14x26	3	60 to 90	50	60x 9½	140	6-6x16-3	6-2	37350
66C	15x26	3½	70 to 100	50	60x 9½	140	6-6x16-5	6-2	37500
20	18x50	2	70 to 100	50 to 60	72x12½	105	11-4x9-4	10-0	60900
20A	19x50	2½	80 to 110	50 to 60	72x12½	105	11-4x9-5	10-0	61050
20B	20x50	3	90 to 120	50 to 60	72x12½	105	11-4x9-6	10-0	61200
20C	21x50	3½	100 to 130	50 to 60	72x12½	105	11-4x9-7	10-0	61350
20D	22x50	4	110 to 140	50 to 60	72x12½	105	11-4x9-8	10-0	61500
20E	23x50	4½	120 to 150	60 to 70	72x12½	105	11-4x9-9	10-0	61650
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Complete Crushing, Elevating, Screening, and Conveying Equipment

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Make Every Shot *COUNT!*

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All doubt in this direction is set at rest when you use Aetna Explosives. They are manufactured from special formulas designed to give maximum disruptive power. Properly placed and fired, Aetna Explosives bring down the rock in profitable quantity—and shattered to the desired size.

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Our engineers are at your service in the design of your plant and are in a position to go into the smallest detail of the arrangement of your reduction equipment.

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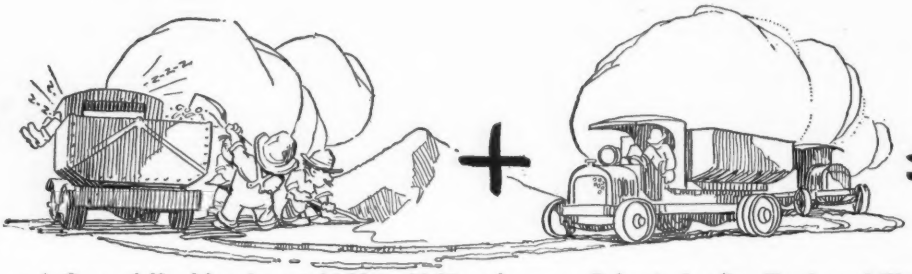

A Gang of Handshovelers at $4.00 to $6.00 each — Delay in Loading Trucks and Waiting for Load

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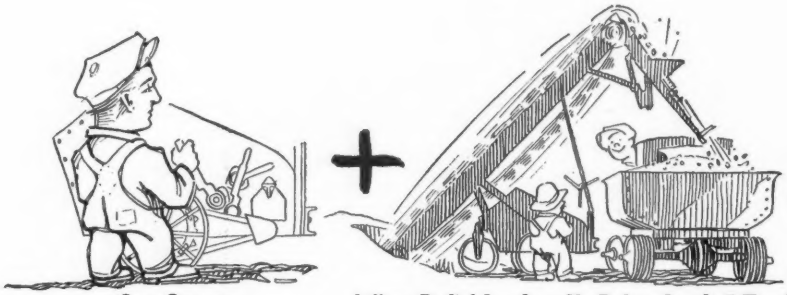

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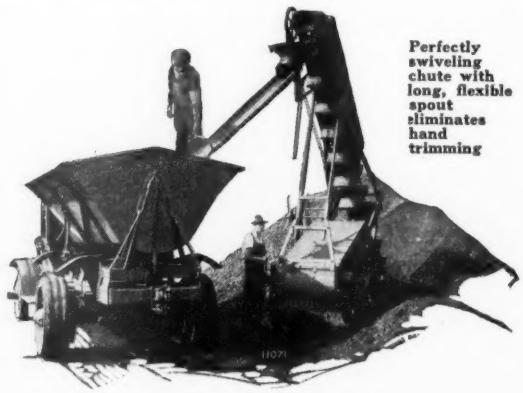
will handle your Crushed Stone, Sand, Gravel, Coal, etc., in less time, at less cost, and more satisfactorily than any other method.

The Jeffrey Radial Loader does away with 5 to 10 men, and the worry and heavy expense of the old, slow, laborious hand shoveling method.

Digs 8 to 10 feet into the pile—a feature which cannot be accomplished with any four-wheeled type of loader.

Three wheel support—enables it to turn a complete circle with either drive wheel as a center.



Perfectly swiveling chute with long, flexible spout eliminates hand trimming

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Handle it Mechanically

"ONE MAN – ONE MINUTE"

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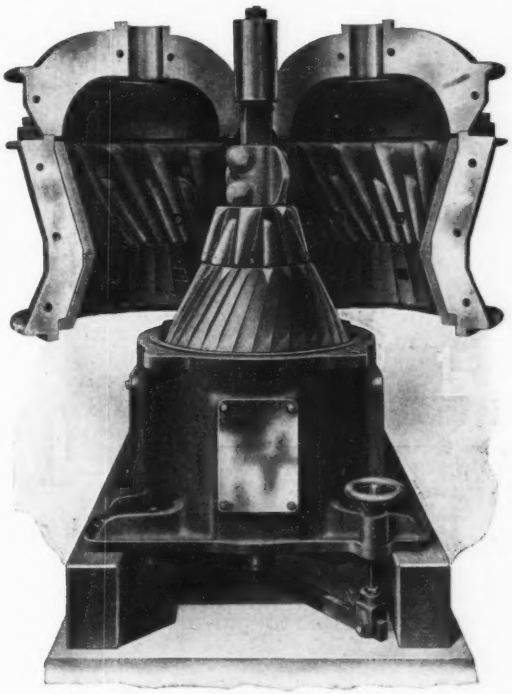
"Open-Door" Rotary Fine Crusher



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Unfasten the bolts, throw open the door and get at all wearing parts. One man can open the door in a very few minutes.

SHUT-DOWNS ARE COSTLY—TIME IS MONEY

"Open-Door" machinery pays because it operates more continuously than any other, therefore production is greater and less time and labor are necessary in case of obstruction or repairs.

BUILT IN FIVE SIZES

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Coal and ore must go from vein to shaft.

Big timber from stump to mill.

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Road materials must follow workmen along the stretch of completed highway.

Mud and refuse must go from dredge to discard.

Stone from quarry to point of shipment.

Clay and marl from pit to pulverizer.

Bulky materials in the work must be taken from plant to plant.

No Matter What The Problem

No matter what the enterprise or industry, if haulage is a problem, then the Plymouth is the solution.

The Plymouth Gasoline Locomotive is the pioneer in industrial haulage. It has been the color-bearer for a score of years. It is the pace-maker with more speed, more power and more years of service.

Have you a haulage problem? Do you want to do more work for less cost and more profit? Do you want a way out of the lack of men and teams?

Then adopt the Plymouth way. Let the Plymouth take the grief and burden. Investigate now.

Our Engineers are at your service. Our bulletins are full of industrial information and haulage solutions.

Write for them.

The FATE-ROOT HEATH CO.

210 RIGGS AVE.

PLYMOUTH, OHIO

Rock Products

Vol. XXIII Chicago, March 27, 1920 No. 7

Recent Addition to Pittsburgh's Fleet of Sand Dredges

Dredge "Progress" and Towboat "Iron City" Latest Type of River Craft Used by Iron City Sand Company

PITTSBURGH is perhaps the largest river sand and gravel producing center in the country. Every traveler in and out of Pittsburgh is more or less familiar with the type of self-propelled ladder dredge used to recover sand and gravel from the river bed.

These dredges resemble the ordinary stern-wheel Ohio River steamboats and are provided with living quarters for the crews and are operated the entire season.

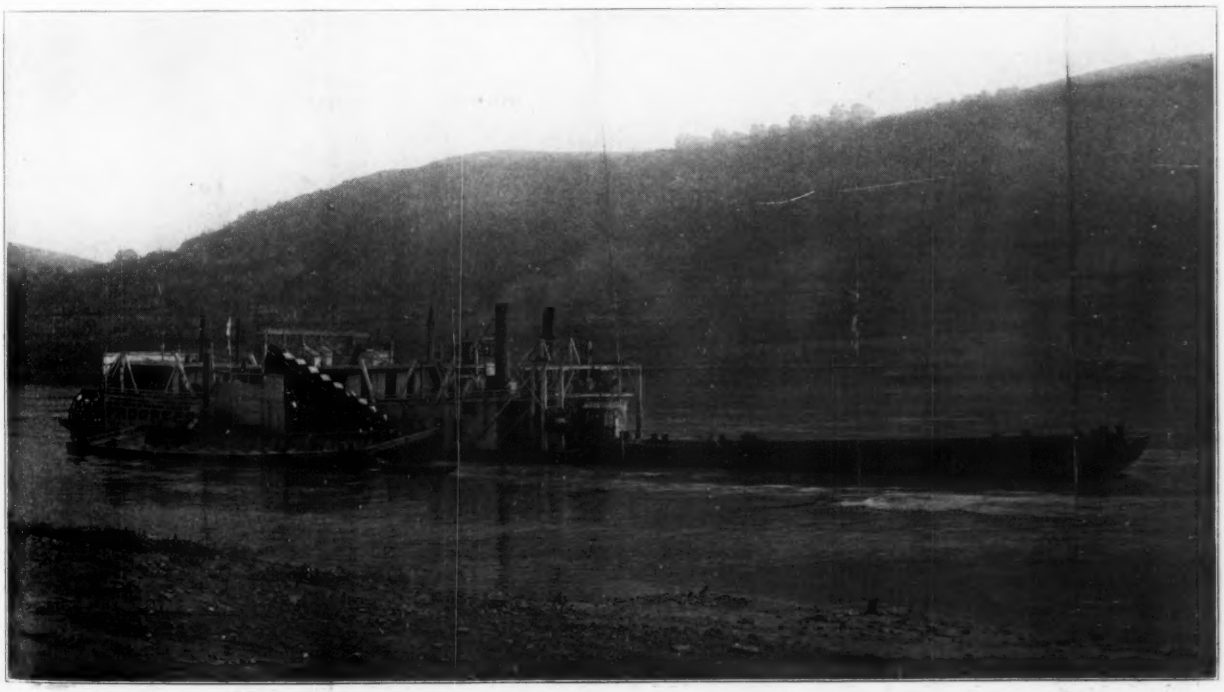
One of the largest operators in the Pittsburgh district is the Iron City Sand Company, which is now operating three dredges of the type described, having a total capacity of from 15,000 to 20,000 tons per day.

The sand and gravel is washed and screened aboard the vessel and the finished product loaded into barges alongside. A fleet of stern-wheel towboats is required to move the barges to and from the city wharves. Deliveries are made at various points along the water front of Pittsburgh, according to the destination of the material.

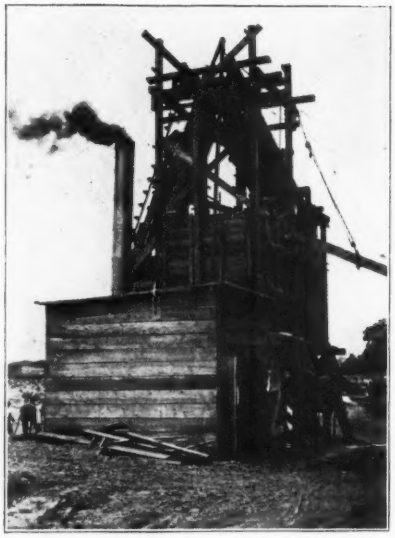
It is said among rivermen that the Iron City Docking Co., the sand company's docking subsidiary, is about the best equipped outfit of its kind in local waters. Its reputation is so good that many river companies owning craft have all their repairs made at these docks.

The company is now operating one of the largest fleets of trucks in the City of Pittsburgh, which, used in conjunction with over 100 head of horses, form a guarantee of prompt service. The entire fleet is under the direct supervision of Philip M. Pfeil, Jr.

Harry G. Pfeil, president and general manager of the company, although a very young man, is one of the best posted sand producers in the business and reputed one of the most successful.



Dredge "Progress" and barges of Pittsburgh's sand and gravel fleet



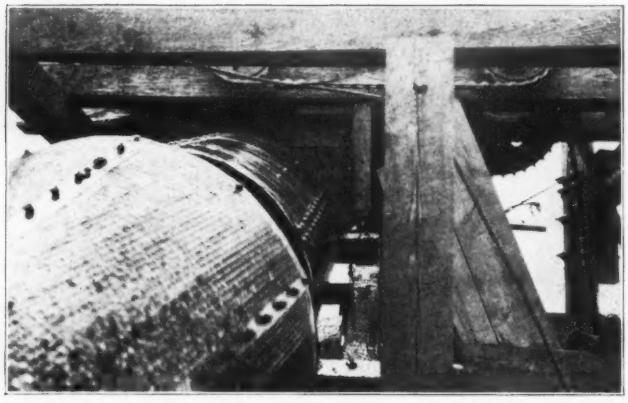
The Small Sand and Gravel Plant

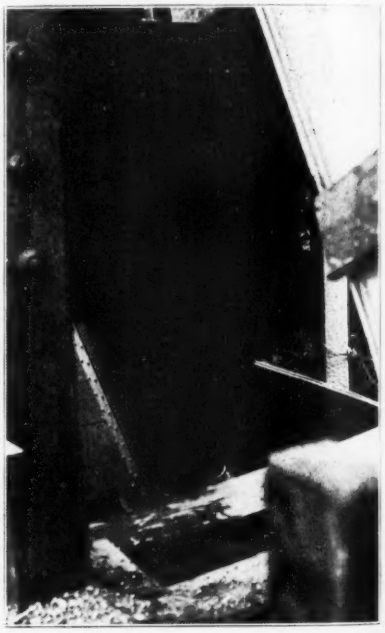
Plant Which Can Be Built for from $8,000 to $10,000

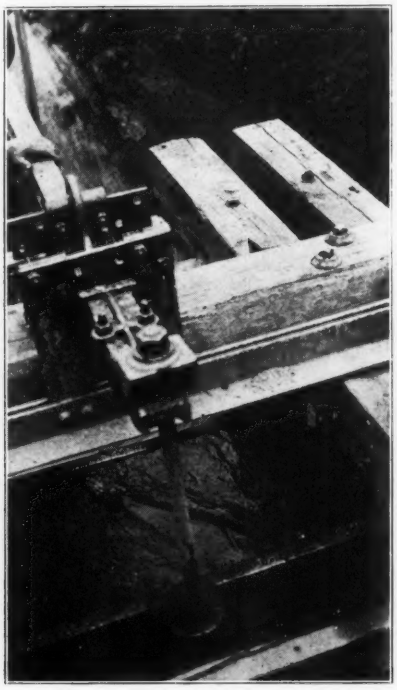
THE PLANT ILLUSTRATED consists of a feeder, elevator, scrubber, screen, Dull sand separator, engine and boiler, pump and piping, which equipment all told cost about $4,000 in 1919. Estimating that the timber and erection cost about as much more, and the sum of $8,000 would have paid for the plant.

The cost of operation is, of course, much greater than a plant of larger size; but, in some few isolated cases, the highway authorities may be willing to pay twice, three or even four times the ordinary price of the commodity in lieu of excessive freight charges. With a capacity of only 100 tons per day, 200 days a year, the output would be 20,000 tons. The life of the plant would be at least five years (100,000 tons), or 10c per ton would take care of its amortization, so that it could be scrapped at the end of its usefulness.

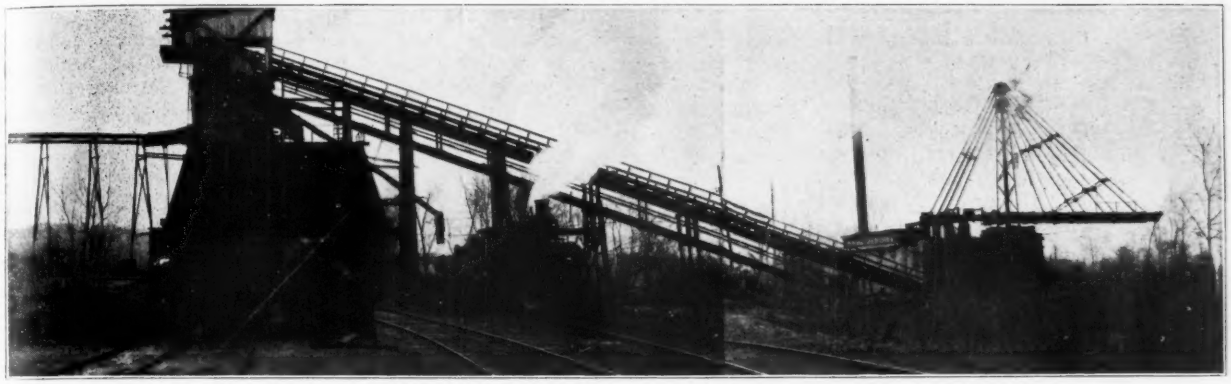
At least one large commercial producer has found considerable profit in the operation of a number of such plants exclusively for highway work, and not in competition with his larger plants. The proposition is worth investigation by any legitimate producer of sand and gravel.







Details of a $10,000 sand and gravel washing and screening plant built for furnishing highway material exclusively



Meramec River Sand and Gravel Plant Operation

The Meramec Cement and Material Company, St. Louis, Pumps Into Barges and Screens and Washes at Shore Plant

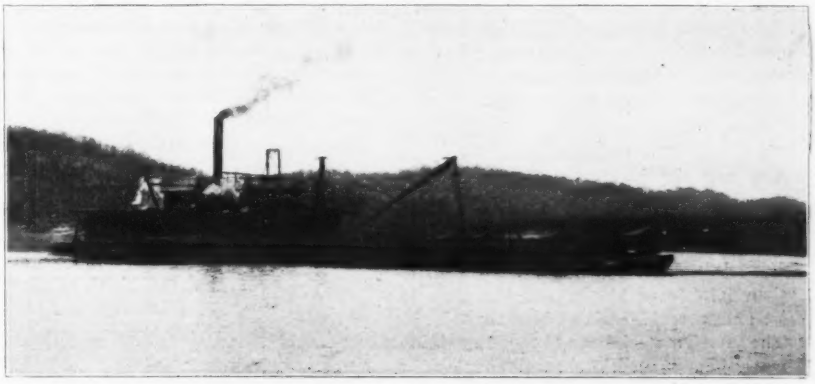
A LARGE and unusually good source of supply of sand and gravel for the St. Louis building trade is the Meramec River. A typical example of the material produced and the method of operation is found at the plant of the Meramec Portland Cement & Material Co., which is at Sherman, 20 miles from St. Louis on the Missouri Pacific Railroad.

The sand and gravel is excavated from the river bed by a floating dredge and is pumped into barges. This type of operation gives a much bigger field of operation than where a pontoon pipe line is used instead of the barges. In this instance the dredge is worked as far as three-quarters of a mile from the screening and washing tower.

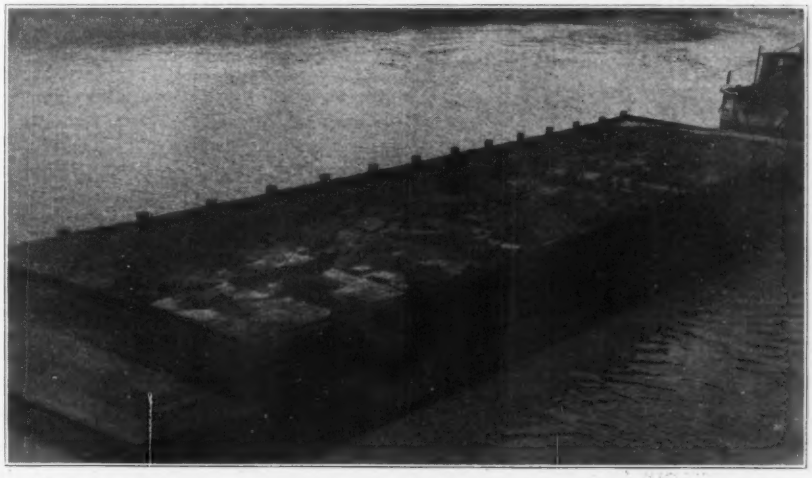
The dredge is operated by steam. The character of the sand and gravel makes its excavation a rather simple operation. It is loose enough to be removed without cutting and the gravel does not run so large that there is any great danger of having the suction clogged by big stones.

The sand and gravel is pumped from the river bed by a 15-in. direct connected steam turbine-driven sand pump which has a capacity of 250 cu. yds. of material per hour. Since the barges also have a capacity of about 250 cu. yds. it requires about one hour to fill one of them.

The barge is pulled back and forth between the dredge and the screening tower on shore by a small steam tug boat, which the company owns. It requires about 20 minutes to make the trip with a loaded barge and some 50 minutes to unload it at the screening tower. The screening plant has been designed of sufficient size to take care of material as fast as it is unloaded.



Dredge of the Meramec Cement and Material Co., St. Louis; one of the largest of river plants—capacity 250 cu. yd. per hour



Type of deck load barge—250 cu. yds. capacity

The method of unloading and handling the sand at the plant is well illustrated in the views. The unloading equipment consists of a traveling clam-shell mounted upon a beam which extends out over the river. The boat is held in position against the unloading wharf by two lines, one forward and one astern.

The bucket travels out over the boat, is lowered and loaded from the barge. Upon its return to the shore end of the beam it is unloaded into a small hopper. This 5-yd. bucket can make three trips per minute., it is claimed.

As fast as the material under the bucket is removed the barge is floated down under the beam by slacking off on the up stream line and taking up the slack with the down stream line. In this manner the boat is moved along by the current as it is unloaded.

From the unloading hopper the material falls upon a belt conveyor and is elevated to the screening and washing plant. The gravel and a 12-in. stream of water are thrown upon a mixing plate at the top of the incline. After a thorough washing and mixing the material is run down over a set of stationary screens and is separated into the various commercial sizes. Material and impurities over 2½ in. are rejected and put into a car to be hauled to a dump.

The inclined screens are directly over bins into which the classified sizes run. The material is divided into five commercial sizes—the largest size being over 1½ in. and passing through a 2-in. bar screen; the next sizes are, over 1 in. and less than 1½ in., over ⅝ in. and less than 1 in., over 1¼ in. and less than ⅝ in. and over ⅛ in. and less than ¼ in. The fine material and the remaining water is deposited in a continuous acting sand box. The valve of this is so adjusted that the clean sand runs out into a bin and the dirt and water overflow and are wasted down the flume. Each bin has a capacity of about three-fourths of a car load and so as fast as material is washed and sized it is loaded either for shipping or to be delivered to the storage yard.

Yard tracks have been provided so that materials may be brought out and unloaded by a locomotive crane and clam-shell bucket. This storage is used for the winter trade.

Power is furnished from a 350-h.p. boiler. This gives steam to the hoist on the unloader, the water pump, and runs an engine-driven dynamo to furnish light and power and to run the belt conveyor. Since no crushers are required the horse power consumption is comparatively low.

Owing to the fact that the plant is located at such an out of the way place it is necessary to operate a boarding-house. The men come out from St. Louis or some of the near-by towns and stay during the working days and go home over Sunday.

When operating two barges the plant has a daily capacity of 50 car loads or about 2,500 tons.

The officers of the Meramec Portland Cement & Material Co. are: J. A. Daly, president; August Herman and Sears Lehmann, vice-presidents; C. C. Collins, secretary; George Ratermann, general manager and purchasing agent, and Mr. La Bee, superintendent of the sand and gravel plant.

A New York Quarry Industry Expands Along New Lines

Dolomite Products Company Takes Over Quarry and Agricultural Limestone Plant of the Becker Limestone Company

A NEW company to take over the properties of the Becker Limestone Co., located in the Buffalo road, one-half mile west of Lincoln Park, near Rochester, N. Y., has been organized with the filing of papers of incorporation with the secretary of state in Albany. The new organization will be known as the Dolomite Products Co.

The company will continue the business of the present Becker company, but will operate it on a more extensive scale. According to the papers filed in Albany, the corporation is capitalized at $165,000 of which $150,000 will consist of 8 per cent cumulative preferred stock and $15,000 in common stock. The papers state the firm will begin business with $50,000.

The directors of the company named are: Fred H. Becker of the Becker Limestone Co.; Matthew P. and John H. Odenbach of the Odenbach Co., and Frank J. Waddell of the Rowe & Waddell Co. The company at the present time manufactures high-grade agricultural limestone, Dolomite limestone, used as a flux in steel mills, open hearth foundry furnaces, and ground limestone for use in glass manufacturing plants.

Noted for Agricultural Purposes

The plant is located on the main line of the New York Central Railroad and low commodity rates have been secured by the corporation for car lot shipments. The plant consists of a mill and equipment, quarry and twenty-three acres of land underlaid with Guelph and Dolomite limestone, averaging 115 feet in depth and covered with comparatively little overburden. According to an analysis and survey made by J. F. Barker, agronomist of the New York State Agricultural Experiment Station of Geneva, Bulletin 47, the land has the highest test limestone to be found in New York State.

The present mill operates throughout with electricity and contains the most modern and improved machinery and conveyors for handling and producing limestone and its products. Among the users of the product are the National Car Wheel Co., the General Railway Signal Co., the T. H. Symington Co., American Laundry Machine Co., F. E. Reed Glass Co., Acme Glass Co. of Hornell, Medina Foundry, the Bignoll Co. of Medina, Massey-Harris Harvester Co. of Batavia and the Pratt and Letchworth Steel Co. of Black Rock.

It is the intention of the present company to extensively develop the present properties and plant and to install additional rock crushing, quarrying and milling equipment to greatly enlarge the output necessitated by the growth of the business.

Offices of the Dolomite Products Co., Inc., have been opened at 124 Ellwanger & Barry Building, Rochester, with John H. Odenbach in charge. The plant office at Lincoln Park will be continued under the direction of Fred H. Becker. The present plant of the Becker Limestone Co. was described in Rock Products, August 28, 1918.

Transportation Discussed at Chicago Conference

THE NATIONAL FEDERATION OF THE BUILDING INDUSTRIES is meeting in Chicago as this issue of Rock Products goes to press. One of the most interesting discussions of this conference of delegates representing practically all the trade associations in the building and construction field was on transportation and freight rates.

The speakers were A. G. Gutheim, a member of the Car Service Commission of the American Railroad Association; E. Guy Sutton, Business Manager of the National Association of Sand and Gravel Producers; R. C. Wright, General Traffic Manager of the Pennsylvania Railroad.

The two speakers representing the railway interests pleaded for patience and more money in the way of freight rates, while Mr. Sutton pleaded for justice against class legislation, such as the clause in the Cummins-Esch railway bill, which gives coal operators preferential treatment in the matter of car service.

New Iowa Quarry Operation

Marquette Stone Products Company to Enter the Field at North McGregor

A LARGE TRACT of Mississippi River limestone bluff, near the roundhouse and shops of the Chicago, Milwaukee and St. Paul Railroad at North McGregor, Iowa, will furnish the material for a large stone crushing plant as the result of the organization of the Marquette Stone Products' Co. at McGregor, March 13.

The company will capitalize at $100,000, of which $60,000 is to be paid in at once. A large block of the capital has been subscribed already by business men of the twin towns, McGregor and North McGregor, which are located side by side on the bank of the Mississippi within three-quarters of a mile of each other. The remainder of the stock will be taken by local parties, it is expected. J. N. Kramer, McGregor, is president of the company and J. M. Berry, mayor of North McGregor, secretary and treasurer.

The new company is the outgrowth of the initiative of the Sawvell Brothers, A. A. and F. A., who in a small way have been engaged in the crushed rock business at North McGregor for three years. The Sawvells, some years ago, bought 21 acres of hill land, which, since the building of the new million-dollar terminal of the Milwaukee Railroad at North McGregor and enlargement of the yards, is partly within the railroad yards. The area comprises a solid bluff of limestone 200 ft. high at its highest point. The brothers, because of the favorable shipping location, were led to buy a No. 4 jaw crusher and commercialize the bluff in a small way, shipping out two years ago 259 carloads. They have also marketed a considerable quantity of one-man riprap to the Milwaukee Railroad, and are at present engaged in getting out an order of this kind.

The new company is comprised of McGregor business men who have watched the success of the Sawvell Brothers and have seen, as they believe, great possibilities in it. The Sawvells are stockholders and will be given a royalty per ton on rock quarried.

The limestone has been given six tests recently at the engineering laboratory of Iowa State College and by the Allis-Chalmers Mfg. Co. of Milwaukee. It tests very high for hardness and 90 per cent lime carbonate.

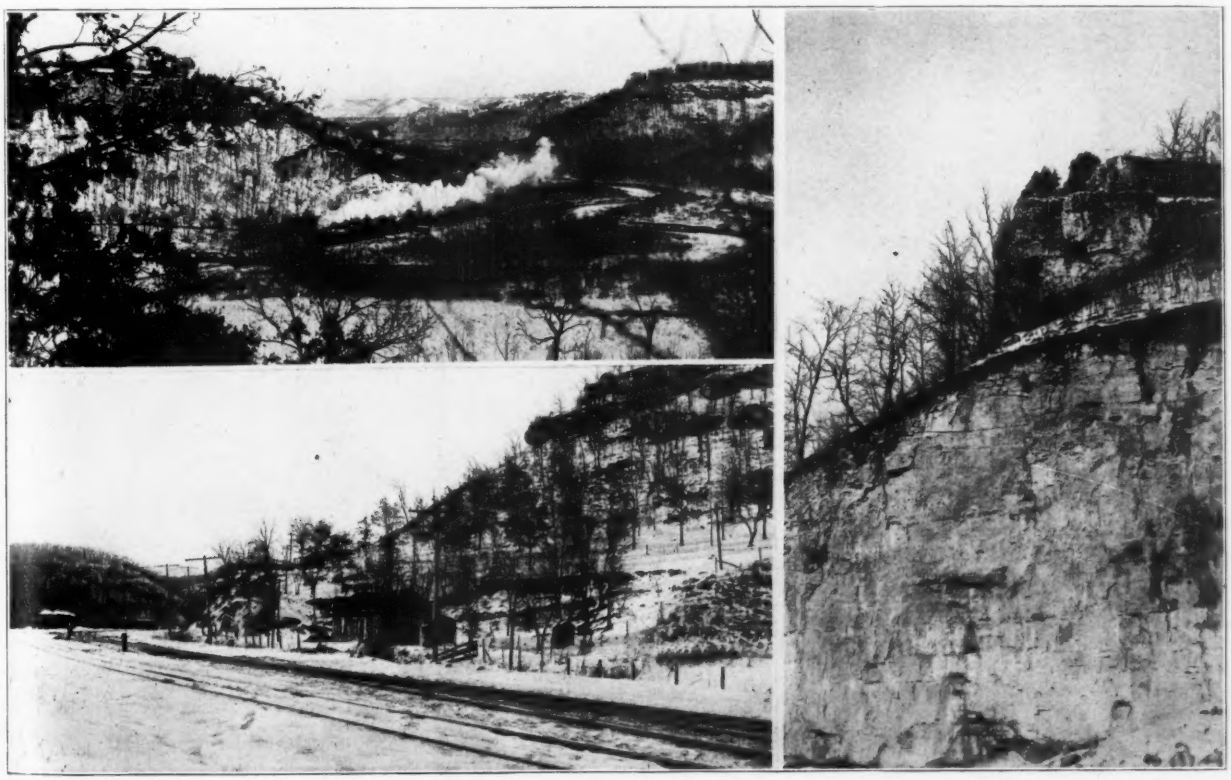
The location of the quarry within the yards of the Milwaukee railway terminal gives the company, as they believe, unparalleled facilities for economical and quick shipment. The terminal is the intersection point of the Savanna-St. Paul line of the Milwaukee, the Milwaukee and Prairie du Chien division, and the North McGregor to Chamberlain South Dakota line. A railroad pontoon bridge spans the Mississippi between North McGregor and Prairie du Chien. Since the completion of one of the finest terminals in the Upper Valley, at North McGregor, the Milwaukee Railroad has been concentrating more and more business there. The yards have several miles of switching tracks. The stone plant has a sidetrack but few hundred yards' distant from the main switching tracks.

Work on construction of a building, storage bins and extension of sidetrack will begin at once and the installation of new machinery follow as quickly as possible. The company has hired an engineer from Chicago to take charge of construction and is on the lookout for a superintendent.

A large amount of city paving is to be done within a radius of 25 miles of the quarry this summer and the company has now in sight all the orders they probably can fill for crushed rock this season. They also have orders from the Milwaukee Railway for more rip rap.

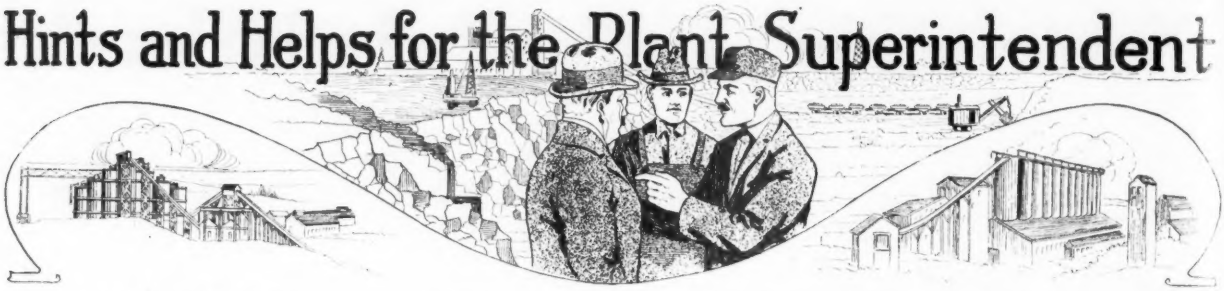
Pulverizing machinery will be put in later on. The company expects to make quite a feature of this, as the lime test is high and "liming" soils is a growing practice among Iowa farmers.

When they are fully equipped the company expects to employ some 30 men.



Location of new Iowa limestone quarry plant at North McGregor

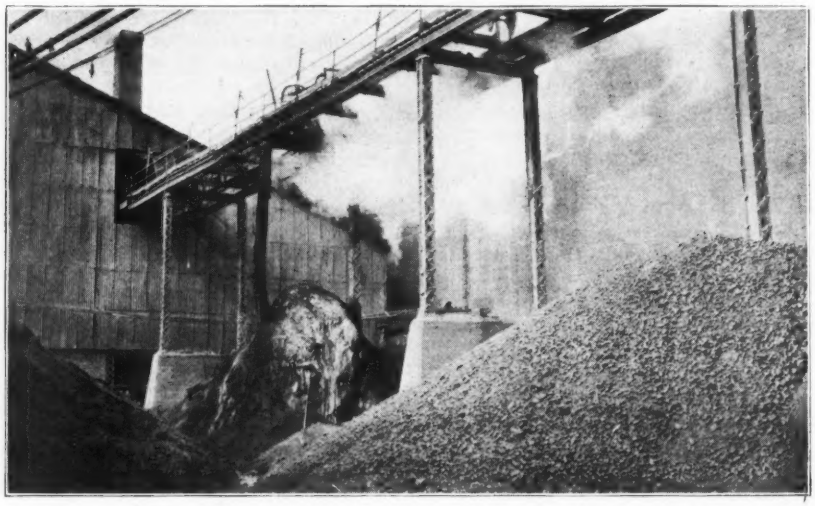
Hints and Helps for the Plant Superintendent



Clinker Cooling

THE VIEW BELOW shows a common method of cement clinker cooling and storing. The cars of hot clinker are passed under a water spray and dumped from a trestle. The second bent of the trestle from the kiln building, which happens to be under the spray, shows the effects of the hot clinker and the accumulation of solidified clinker between the columns.

The condition shown is probably more unsightly than actually dangerous, but it proves that cement plant builders do not always foresee operating conditions.



What hot clinker will do to structural steel

Storing coal for lime-plant operation

Whims of Centrifugal Sand Pumps

EXPERIENCES of various operators with centrifugal sand and gravel pumps leads one to the conclusion that they are as whimsical as the proverbial woman. A prominent Minneapolis operator had all kinds of trouble with a pump he used for getting his clean wash water, because this water carried a considerable amount of fine sand.

As an experiment he had the runner turned down half an inch, to give that much more clearance in the shell, and ever since then the pump has worked like a charm. Which all goes to show you can't pump sand and gravel, or even sandy water successfully without doing a little experimenting to find the right combination.

Experiences of other pump operators are probably equally interesting and valuable and all who have such experience are urged to send letters to ROCK PRODUCTS, giving data which will save others endless trouble and experiment to find out the same things.

Storing Coal at Lime Plants

A VERY USEFUL piece of equipment about a lime plant is a portable belt conveyor. The accompanying view was taken at an eastern lime plant last fall, just before the coal miners' strike and shows how one lime man with foresight made hay while the sun was shining.

Such a device could be used with equal economy to load lump lime in box cars or to elevate coal from a ground storage pile to the firing floor of a kiln plant. Lime manufacturers are finding out more and more that the only insurance against operating interruptions under present uncertain conditions is to have several months' supply of fuel ahead.

Of course, in warm weather, with a bituminous coal high in sulphur, open-air storage in piles is risky and the coal will deteriorate to some extent.

Question Box

GOT a problem you want help on? Send it in. We will agree to find some operating man who can answer it.

Accident Prevention in Stone Quarries

By Oliver Bowles
U. S. Bureau of Mines

ON JANUARY 15, 1920, a man was killed by falling rock in a limestone quarry in Utah. The quarry was visited by a representative of the Industrial Commission of Utah, and the cause of the accident was carefully determined. The facts concerning this accident, and the Bureau of Mines' recommendations are given in some detail in the hope that quarrymen may take steps to avoid dangerous conditions and thus reduce the liability to accident.

The quarry rock face is about 180 ft. high, and the ledge is covered with an overburden of 10 to 20 ft. of a mixture of soil and bowlders. The rock face is not vertical, but slants at an angle of about 45° to 50°, while the stripping face stands at an angle of 70° to 80°, and is flush with the rock face. The conditions are shown in the accompanying figure.

The man who was killed was employed in breaking rock at the foot of the quarry wall. The sun had been shining on the stripping face and probably thawed the ground, thus permitting a boulder weighing about 20 pounds to roll down the slanting face, striking and almost instantly killing the workman who was working with his back toward the quarry wall.

The most obvious means of avoiding such accidents is to carry stripping operations ahead of quarry operations and thus maintain a clean rock surface at the edge of the excavation. If the stripping face occupied a position as represented at "A" in the figure, any loose material that fell from it would remain on the level rock floor "B" and would not fall into the quarry pit.

The attention of quarry operators is directed to the fact that the bureau has issued a set of safety rules for stone quarries in Technical Paper 111, entitled, "Safety in Stone Quarrying." On page 28 of this publication, a rule which completely covers the dangerous condition present in this quarry reads as follows: "The stripped rock surface between the bank and the quarry pit should be wide enough so that there is no danger of soil falling or bowlders rolling over the edge of the excavation. Serious accidents have resulted from slides of overburden into the quarry pit. The practice of making stripping walls almost continuous with quarry walls is very dangerous. If the stripped surface is narrow, or if it slants toward the excavation in such a manner that there is a possibility of material falling over the edge, a protecting fence should be maintained along the edge of the pit."

It is obvious that if quarry operators were familiar with the contents of this paper and put into practice the rules given therein the liability to such accidents would be reduced to a minimum. Safety pays, both in reputation and in ultimate economy, and quarrymen are urged to familiarize themselves with safety rules and to immediately put them to practical use. Copies of Technical Paper 111 may be obtained by directing a request to the Bureau of Mines, Washington, D. C.—U. S. Bureau of Mines, Reports of Investigations.

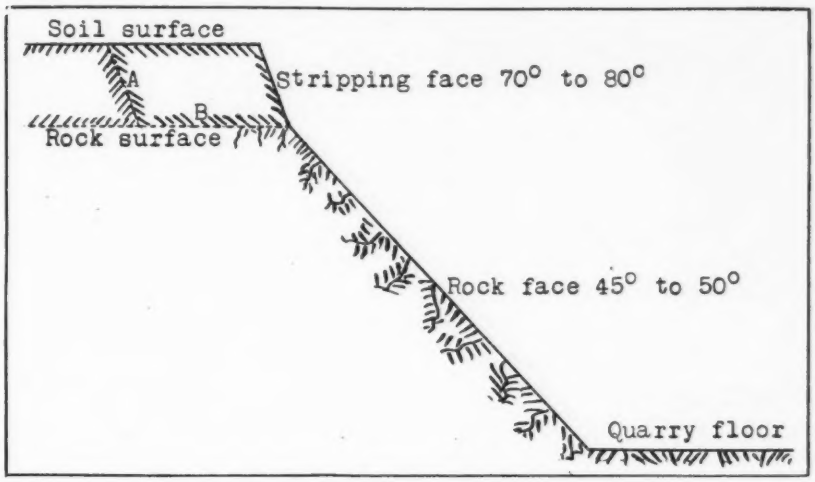


Diagram to illustrate proper precautions in stripping

Stripping Gravel Pit

THE USE of a bottomless scraper bucket for stripping the overburden at the plant of the Diamond Sand & Gravel Co., Bedford, Ohio, described, with a diagram, in ROCK PRODUCTS, February 28, page 26, is shown in the two views below. These give an idea of the topography of the gravel deposit and the character of the material stripped. The operation was successfully completed many months ago, according to Sauerman Brothers, Chicago, who made the installation.

Bottomless scraper bucket used successfully for stripping a gravel deposit.—Left bucket discharging.—Right showing character of material stripped

Value of Quarry and Plant By-Products as Fertilizers

What the Essential Elements of Plant Food and Soil Correctives Are and the Forms They Occur In

By John H. Voorhees
Associate Editor, "Pennsylvania Farmer," Philadelphia, Penn.

SINCE THE PUBLICATION of my article in ROCK PRODUCTS entitled "Agricultural Lime Compared and Priced on Unit Basis," I have been the recipient of many requests for information regarding the agricultural value for fertilizing purposes of many by-products from manufacturing, over-burdens from quarrying operations, and the like.

For instance, one party from Tennessee writes "that it is necessary to remove 20 ft. of soft shale from a seam of coal to operate. This shale contains one per cent of nitrogen and one per cent of sulphur. Could this material be utilized in the manufacture of fertilizer?"

Believing that it will be of value to manufacturers, quarrymen, and others who have similar problems, I am outlining here a few of the steps necessary to determine the value of any such material for fertilizing purposes, and points of information regarding the use of such materials from the point of view of the fertilizer trade and the farmer.

Essential Plant Foods

The farmer is interested primarily in what are called the essential elements of plant food, and materials which have an indirect action in making the plant food elements already in the soil available or usable by the plant, or in other words, those materials, which, by an indirect means, make the soil a better medium for the growth of plants.

There are at least ten elements used by plants which are obtained from the soil. These are nitrogen, phosphorus (expressed in terms of phosphoric acid P_2O_5) potassium (expressed in terms of potash or K_2O), calcium, magnesium, sulphur, iron, sodium, chlorin, and silicon. Of these, nitrogen, phosphoric acid, and potash are considered the "essential elements of plant food," because all plants require them in rather large quantities, and because soils contain them in relatively small quantities. The remaining seven elements are used in greater or less quantity and become the limiting factors of plant growth only, so far as we know, in the case of some special crops which require them in unusually large quantities, or in the case of some soils particularly deficient in them.

Calcium is used in rather large quantities by alfalfa. A ton of alfalfa hay contains 35 pounds of calcium. A crop of five tons will remove 175 pounds of calcium, equivalent to 438 pounds of pure calcium carbonate (limestone). In the same manner the soils of the Northwest along the Pacific in Oregon and Washington are deficient in sulphur, and similarly peanuts seem to do well on soils well supplied with this element, but the big bulk of fertilizer trade at the present time concerns only the essential elements.

Value Depends on These Plant Foods

Hence, the first thing to learn regarding a by-product or similar material is the exact amount of nitrogen, phosphoric acid and potash it contains. And more than this, the form in which it occurs is important. Nitrogen occurs in three forms —organic, ammonia, and nitrate. The first is insoluble and must be acted upon by bacteria to change it to the nitrate form before plants may use it. For this reason it has a special use on the farm in that the bacteria which change it increase in activity directly as the heat of the soil increases from spring to summer; and such materials are valuable mainly for long growing crops which continue to grow throughout the entire growing season. On the other hand, ammonia and nitrate nitrogen are immediately soluble, especially the latter, and may be used to feed the plant at any time.

Throughout the East phosphoric acid is of value mainly when it is soluble unless it is in the organic form. In the West many materials containing insoluble phosphoric acid are used very commonly. One place or another, soluble phosphoric acid is generally worth twice as much as insoluble phosphoric acid. And in the case of materials containing potash in an insoluble form, as silicates and aluminates, they are practically valueless as fertilizer materials.

Value as Soil Correctives

On the other hand, there are numerous materials which are of value because of the secondary function they exert. Materials of organic origin and materials containing calcium or magnesium are of particular importance from this point of view. Sulphur might also be included in this class. They are indirect manures or fertilizers.

It is, therefore, necessary in order to determine the value of any material for soil treatment to have an analysis made which will include the following data:

(1) per cent of moisture
(2) per cent of organic matter
(3) per cent of calcium (and form)
(4) per cent of magnesium
(5) per cent of total nitrogen
(6) per cent of soluble nitrogen
(7) per cent of insoluble nitrogen
(8) per cent of total phosphoric acid (P_2O_5)
(9) per cent of available " " "
(10) per cent of insoluble " " "
(11) per cent of total potash (K_2O)
(12) per cent of avail. " "
(13) per cent of insol. " "

The chemist will understand what is needed if such a request is made, and he will make sure before proceeding by consulting a state chemist on the methods used in the analysis of fertilizer materials. When this data is obtained the prices of the various elements and the forms of each may be obtained from any good fertilizer manufacturer.

Mechanical Analysis

In some cases a mechanical analysis is advisable. The fineness of division of any material is an important factor regardless of whether the material is sufficiently concentrated and valuable to sell direct to farmers or whether it is to be sold to a manufacturer of commercial fertilizers as a filler. Usually this may be determined by the owner through the use of common sense, at least, sufficiently well until after the chemical analysis has been made and the value of the contents is determined. In general, a dry, fine material is most valuable, for various reasons.

When this information is obtained, then it is necessary to take into consideration all of those problems pertaining to the local handling of the material, including quarrying, drying, grinding, grading, sacking, transportation and the like, which are strictly local or individual. Of course, the more valuable a material in the raw state the more chance there is of marketing it and paying preparation charges and still having a profit. In some cases, however, a dry, fine material of low value and concentration may be readily marketed as a filler for fertilizers if it is in good mechanical condition.

Railway Ballast Outlook Good

Not in Prospect of Immediate Orders, but Big Systems All Favor Purchase from Commercial Producers—Proposed Crushed Stone Specifications

A DECIDED REVIVAL of interest in railway track maintenance was evidenced at the annual convention of the American Railway Engineering Association in Chicago on March 16, 17 and 18—the first convention since the Government has released its strangle hold on the initiative of railway executives. This association is composed of the railway engineering officers of practically every American road and its conclusions have an enormous influence.

Report of Committee on Ballast

The report of the committee on ballast contains much of interest to crushed-stone and sand and gravel producers. The work assigned to this committee was:

1. (a) Make critical examination of the subject-matter in the Manual, and submit definite recommendations for changes.

(b) Recommend subjects for consideration by the ballast committee next year, considering the possibility of starting inquiry on this subject during the year 1919.

2. Report on the proper depth of ballast of various kinds to insure uniform distribution of loads on the roadbed, conferring with special committee on stresses in railroad track and committee on roadway.

3. Report on methods and comparative cost of applying ballast, giving special attention to the organization of the ballast gang.

4. (a) Study and report on gravel-washing plants.

(b) Study and report on stone-crushing plants.

5. Report on the use of reinforced concrete slabs or other devices to assist the ballast in distributing the load on soft roadbeds.

Prefer to Purchase Ballast

The subject (4) is of course of vital interest to commercial sand and gravel and crushed-stone producers, with whom ballast represents a considerable part of their production. This subject was in the hands of a sub-committee, which reported in substance as follows: "The membership was circularized relative to gravel-washing and stone-crushing plants and it developed that but few roads owned such plants. The great majority, as indicated by the replies, buy their heavy ballast, such as crushed-stone, washed gravel and slag from privately operated plants and consider that it is expedient and economical to do so."

The accompanying tables give the results of this investigation in regard to the specific railways mentioned.

Points in Design of Ballast Plant

One of the objects of the sub-committee on sand and gravel and crushed-stone plants was to get up plans and specifications for a "standard ballast plant." This matter was reported on by the committee as follows:

"Sufficient study has not been given

GRAVEL WASHING AND STONE CRUSHING PLANTS

ROAD	(a) Plans and specifications, if possible, or a sketch with description; together with track layout and your recommendations as to improvements in methods of operation or detail of these plants.	(b) Furnish the Committee with a descriptive narrative of the operation of any plants that appeal to you as being handled successfully. The object being to furnish the Association with practical information of value to its members.	(c) Does your company own its plant or do you buy from outside parties?	(d) In your opinion is it more economical to buy from commercial manufacturers in preference to building and operating your own plant?
A.T.&S.F..	No plan.....	No plants.....	Buy from commercial manufacturers	"Where good commercial plants are located within a reasonable hauling distance, more economical to buy from them."
Atlantic Coast Line	No plan.....	No plants.....	Buy from commercial manufacturers	"Much more economical to buy from contractors."
B. & O.....	No plan.....	No plants.....	Buy from commercial manufacturers	"More economical to purchase from commercial producers than to build and operate our own plant."
B. & O. Chicago Term.	No plan.....	Mention Brownell Improvement Co., Thornton, Ill.....	Buy from commercial manufacturers	"More economical for small lines to buy outside."
B. & A.....	We have none.....	No plants.....	Buy from commercial manufacturers	"Depends entirely on amount used, quality and price of product furnished by manufacturers."
B. R. & P..	We have none. Track layout of LeRoy Stone Co., LeRoy, N. Y.....	Nothing to suggest.	Buy stone from commercial manfacturers.....	"Yes."
C. C. & O..	No plan.....	Plans and track layout of plant originally owned by the company.....	Buy from commercial manufacturers	Depends entirely upon your requirements. A private plant has the advantage of being able to handle commercial business and keep going and supply small amounts of ballast at times of restricted expenditure for railroad maintenance.
Cent. of Ga. Ry.	No plan.....	No plants.....	Buy washed gravel and stone from commercial manufacturers.....	Account of small amount used more economical to buy.
Cent. R. R. of N. J.	No plan.....	No plants.....	No answer.....	No answer.
C. & E. I...	No plan.....	No plants.....	Buy from commercial manufacturers	"More economical to purchase the material from commercial manufacturers."
C. B. & Q. Lines west of Missouri River.....	No plan.....	No plants.....	Have two gravel pits. No washing plants.....	.....

the subject and sufficient data is not at hand to attempt to design a standard plant.

"Your committee believes that local conditions will exert such a controlling influence that a most general outline describing the important points to be secured and the ones to be avoided, may be all that is possible.

"In view of the fact that so few roads own their own plants or think it is expedient to do so, your committee has, for this year's report, merely filed with the association a list of the answers to the questionnaire and such plans as have been furnished, properly indexed so that the information will be available for the use of anyone interested.

"The desirable points to be considered in designing a crushing or washing plant assuming that suitable material in sufficient quantity is readily accessible, may be summarized as follows:

"(a) Combine production of ballast material with production of material for commercial use to ensure a continuous market for a sufficient quantity to warrant the installation of a plant of economical size.

"(b) Make the mechanical lift required a minimum.

"(c) Eliminate hand work as far as possible.

"(d) Arrange track layout to spot by gravity and require switching the yard only once a day.

"(e) So far as possible, arrange for the material to move by gravity and not by power.

"(f) Arrange machinery and screens in sequence so that the material will move in a direct path from the quarry or pit through the plant to the cars.

"(g) Machinery is subject to hard wear and should be readily accessible and easily removed for repairs and replacements.

"(h) Crushed stone wears the chutes rapidly, particularly at bends and junctions. Sometimes a drop or pocket can be left at these points to hold enough stone to take this wear and save the chute.

"(i) Convenience in weighing is desirable."

GRAVEL WASHING AND STONE CRUSHING PLANTS—Continued

ROAD	(a) Plans and specifications, if possible, or a sketch with description, together with track layout and your recommendations as to improvements in methods of operation or detail of these plants.	(b) Furnish the Committee with a descriptive narrative of the operation of any plants that appeal to you as being handled successfully. The object being to furnish the Association with practical information of value to its members.	(c) Does your company own its plant or do you buy from outside parties?	(d) In your opinion is it more economical to buy from commercial manufacturers in preference to building and operating your own plant?
C.M.&St.P.	No plan.....	No plants.....	Buy from commercial manufacturers	"Much more economical in our case as we have a large number of satisfactory crushing and gravel washing plants along the line and frequently save in transportation what it would cost if we had a plant of our own."
E. J. & E...	No plans.....	No plants.....	Own pit and buy from operator. See appendix.....	"More economical for railroad company to buy gravel from commercial plant."
Grand Trunk	No plans.....	"Track layout requires special study for each plant and no general design is adaptable." Plans of D. & S. plant, Chicago, with narrative.....	Use unwashed gravel dug by company forces from own pit.....	"In our opinion it is more economical to purchase crushed stone from commercial manufacturers.
Kansas City Term.....	No plans.....	No plants near.....	Buy from outside plants.....	"Determined by local conditions."
L. E. & W..	No plans.....	No plants.....	Buy crushed stone from commercial manufacturers.....	"Determined by the amount used."
L. & N.....	No plans.....	No plants.....	Own a small plant and buy from commercial manufacturers.....	"If price is satisfactory best to buy from commercial manufacturers. On large system it is best to have ballast production on each operating division."
M. & St. L..	No plans.....	No plants.....	"Washed gravel and crushed stone are purchased from outside parties".	"For road using small amount it is better to buy from commercial plant. For line using large amount better to own."
N. Y. C....	No plans.....	Track layouts of 3 plants.....	Buy from commercial manufacturers	.....
N. Y. N. H. & H.....	No plans.....	No plants.....	Buy from commercial manufacturers	"More economical to purchase from commercial manufacturers."
Penna. Lines East of Pittsburgh	No plans.....	No plants.....	"Purchase practically all ballast and believe that superior to establishing plants for crushing stone and gravel washing."	"Difficult for railroad maintain an organization of experienced men."

Prospects in 1920

It was evident that there was a full appreciation of the need to have ballasting start as soon as labor and financial conditions permit, but the opinion was given that this year (1920) would see the "greatest scarcity of track labor the railways have ever experienced." If this proves true, of course comparatively little ballast will be purchased this year.

Good Word for Washed Gravel

C. J. Coon of the New York Central Lines said:

"Most of the committee has been over the Richmond, Fredericksburg and Potomac and has made a critical examination of the conditions there, washed gravel having been used for many years. The indications were that that road was getting a very much better wear out of the rail, owing to the fact that it had splendid drainage from the washed gravel ballast. A great many roads are increasing the weight of their rails, and this does not take care of the situation, for you cannot do it all with the rail. You must take care of some of it with the tie, the increased depth of ballast and a better class of ballast. Temporarily, in a territory where you cannot get good stone, the next best thing, in the opinion of the committee, is washed gravel ballast."

Conclusions of Committee

"That the definitions in the 'Manual' should be arranged in alphabetical order.

"That the depth of ballast should be restated.

"That concrete slabs placed under the ballast on soft roadbed where traffic is heavy, and at times under other exceptional circumstances, indicate that a considerable degree of success may be expected from their use and at reasonable expense.

Committee: H. L. Ripley (N. Y., N. H. & H.), chairman; J. M. Meade, (A., T. & S. F.), vice-chairman; C. W. Baldridge (A., T. & S. F.), J. S. Bassett, W. J. Bergen (N. Y. C. & St. L.), F. W. Bettle (T. & P.), Theodore Bloecher (B. & O.), H. E. Boardman (N. Y. C.), C. J. Coon (N. Y. C.), T. W. Fatherson (C. G. W.), H. E. Hale (Pres. Conf. Com.), G. H. Harris (M. C.), F. A. Jones (M. P.), J. S. McBride (C. & E. I.), S. B. Rice (R. F. & P.), D. L. Sommerville (N. Y. C.), Paul Sterling (N. Y., N. H. & H.), F. J. Stimson (P. R. R.), D. W. Thrower (I. C.), W. K. Walker (Wabash), R. C. White (M. P.), W. D. Williams (C. N.).

Proposed Specifications for Crushed-Stone Ballast

THE following proposed specifications are submitted to the membership for criticism and suggestions. Crushed-stone producers are urged to read them, and their suggestions would undoubtedly be welcomed by the committee, of which H. L. Ripley, chief engineer of the New York, New Haven and Hartford R. R., New Haven, Conn., is chairman.

Physical Qualities—General

Stone for the use in the manufacture of ballast shall break into angular fragments which range with fair uniformity between the maximum and the minimum size specified herein; it shall test high in weight, hardness, strength and durability, but low in absorption, solubility and cementing qualities.

Tests

Tests shall be made as follows:

Weight—Not less than one-half cubic foot of the stone accurately measured and dried for not less than twelve hours in dry air at a temperature of between 125 and 140 degrees Fahrenheit shall be weighed. The weight shall not be less than ..... lbs. per cubic foot.

Note—Of the stone available, that having the maximum should be used; a high quality stone for ballast will weigh 168 lbs. per cubic foot.

Strength—Two-inch cubes of the stone shall be sawed to reasonably accurate dimensions and the top and bottom faces made accurately parallel. For the primary test, the test speciments shall be dried for two hours in dry air at a temperature of between 120 and 140 degrees Fahrenheit and at the time of test the temperature of the specimen shall be not less than 50 degrees. Tests shall be made in a testing machine of standard form and the stone shall have a compressive strength of ..... lbs. per square inch.

Note—Of the stone available, that having the maximum compressive strength should be used; a high quality stone for ballast will have a strength of 10,000 lbs. per square inch.

A secondary test shall be made on specimens the same in all respects as for the primary test except that the blocks shall have been completely immersed in clean water, of a temperature between 35 and 90 degrees, for 96 hours, the test to be made within 30 minutes of removal from the water.

If the compressive strength shall have decreased more than ..... per cent from the primary tests, the rock shall be deemed unsuitable for ballast purposes.

Note—Of the stone available, that showing the least difference between the results of the primary and secondary test should be used; a high quality stone for ballast should show not over 1 per cent difference.

Solubility—One-fourth cubic foot of the rock shall be crushed and thoroughly washed. The particles shall then be placed in a glass vessel and covered with clear

GRAVEL WASHING AND STONE CRUSHING PLANTS—Continued

ROAD	(a) Plans and specifications, if possible, or a sketch with description, together with track layout and your recommendations as to improvements in methods of operation or detail of these plants.	(b) Furnish the Committee with a descriptive narrative of the operation of any plants that appeal to you as being handled successfully. The object being to furnish the Association with practical information of value to its members.	(c) Does your company own its plant or do you buy from outside parties?	(d) In your opinion is it more economical to buy from commercial manufacturers in preference to building and operating your own plant?
Penna. Lines West of Pittsburgh	Proposed track layout, Brinkhaven, Ohio.....	Give list of 5 plants. See appendix	Own one plant at Macksville, Ind.; also buy from commercial manufacturers.....	"More economical to buy from commercial manufacturers." See appendix.
P. & R.....	No plans.....	No plants.....	Buy from commercial manufacturers	"Yes"
Seaboard Air Line	No plans.....	Narratives of plants at Lilesville and Garysbury, N. C..	Buy from commercial manufacturers	No opinion.
Southern...	No plans.....	No plants.....	"Do not own any."...	No opinion.
St. L. S. W..	No plans.....	No plants.....	No answer.....	No opinion.
Union Pacific	No plans.....	No plants.....	Use Sherman Hill gravel consisting of disintegrated granite loaded by steam shovel. No crushing or washing necessary.....	"From our experience where raw material is available more economical for railroad to buy than own plant."
Wabash....	No plans.....	No plants.....	Do not own or operate pits. Buy gravel from commercial plants....	No opinion.
Det. T. & I.	No plans.....	No plants.....	Buy from commercial manufacturers	"More economical to purchase from commercial manufacturers."
D. L. & W..	Track layout of Nichols, N. Y., Washing Plant....	Plans and narrative	Own 1 washing and 2 crushing plants' also purchase from outside plants.....	"If your requirements keep plants operated to their maximum capacity, more economical to own your own plant."
D. & I. R..	No plans.....	No plants.....	Use pit gravel without washing.....	"Cheaper to purchase than to operate a plant."
D. M. & N.	No plans.....	No plants..	Purchase from outside parties.	"Cheaper to purchase than to operate a plant."
Cincinnati Northern	No plans.....	Plans, photographs and narratives of two plants.....	Buy from commercial manufacturers	.....
R. F. & P..	Plans of company plant. See appendix.....	Two sets of plans, one of Massapomax, Va., plant, and other of Musterfield Gravel Co. plant, Richmond, Va.....	Operate washed gravel plant.....	Operate company plant.

water. The vessel shall be thoroughly shaken for five-minute periods at 12-hour intervals for 48 hours. If any discoloration of the water occurs, the rock shall be deemed soluble and undesirable for use as ballast.

Test No. 1

Wear or Durability—One-half a cubic yard of washed stone which will pass through the maximum and be retained on the minimum screen shall be spread over a wire mesh or iron surface to a depth of not more than 3 inches and exposed to a dry heat of from 125 to 140 degrees Fahrenheit for a period of two hours. After the dried stone is carefully weighed it shall be given 10,000 revolutions in a tumbler approximately four feet in diameter, of not less than two cubic yards capacity and operating at 25 revolutions per minute.

The sample shall then be passed over a screen of the minimum dimension provided for sizing the ballast, again washed and dried in the same manner as before the test and again carefully weighed.

If the decrease in weight shall be more than ..... per cent of the original weight of the sample, the stone shall be deemed unfit for use as ballast.

Outside of the breakage, which is exhibited by the small particles which will pass through a minimum screen but will not pass a sieve of 20 meshes to the inch, the wear should not exceed ..... per cent.

Note—Of the stone available, that showing the smallest loss in weight should be used; a high quality stone for ballast will show a loss of not more than 1 per cent in fragments which will pass a screen of 20 meshes to the inch, and not more than 3 per cent in those passing the minimum sizing screen.

Test No. 2 (Quick Weathering Test)

One-half a cubic yard of stone shall be dried and weighed as for Test No. 1. It shall then be immersed in water for six hours and then while still wet be placed in a refrigerating plant and subjected to a temperature of approximately zero Fahrenheit for two hours. It shall then be removed and the temperature gradually raised in two hours to 100 degrees and that heat continued for two hours, when it shall be immersed as before and again subjected to approximately zero temperature.

The freezing and thawing shall be repeated to a total of ten exposures. If any tendency to disintegrate is observable the stone should be considered unsuitable for ballast. Otherwise the material shall again be subjected to a wear test as provided under Test No. 1. If in this wear test the maximum decrease in weight shall be in excess of ..... per cent, it shall be deemed unsuitable for use as ballast.

Note—Of the stone available, that showing the minimum average decrease in weight should be used; a high quality stone for ballast will not show a decrease in fragments which will pass the minimum sizing screen of more than 4 per cent.

Absorption

One-half a cubic yard of washed stone, which will pass through the maximum and be retained on the minimum screen, shall be spread over a wire mesh or iron surface to a depth of not more than 3 inches, and exposed to a dry heat of from 125 to 140 degrees Fahrenheit for a period of 6 hours. After the dried stone is carefully weighed it shall be submerged in clean water for a period of 96 hours. It shall then be removed from water and exposed to a normal air in the shade and at a temperature between 40 and 48 degrees, and allowed to drip for 30 minutes, when it shall again be weighed and the difference in weight shall be used to determine the rate of absorption. Stone showing an absorption of more than ..... lbs. per cubic foot is unsuitable for ballast.

Note—Of the stone available, that showing the minimum absorption should be used; a high quality stone for ballast will have an absorption of not more than 0.50 lb. per cubic foot.

Cementing Quality

A five-pound sample of the rock thoroughly washed and dried shall be crushed until it will pass through a screen of one-fourth inch mesh. This material shall be placed in a ball mill which contains two steel shot weighing 20 lbs. each, and the mill revolved at the rate of 30 revolutions per minute until it has made 2,000 revolutions for each pound of sample in the mill.

Sufficient clean water shall be added to make a consistent mortar, which shall then be molded into 1-inch cubical briquettes, formed under 10 lbs. pressure. All of the briquettes shall then be allowed to dry 20 hours in air, when one-third of them shall be tested for compressive strength.

One-third shall be kept for four hours in a steam bath and the remainder shall be immersed for four hours in clean water at a temperature between 50 and 60 degrees Fahrenheit and then tested for compressive strength.

If in any of these tests a compressive strength greater than ..... lbs. per square inch is developed, the material shall be deemed unsuitable for ballast.

Note—Of the stone available, that from which the briquettes show the minimum strength should be used; a high quality stone will show not to exceed 4 lbs. per square inch.

Requirements—Breaking

Stone for ballast shall be broken into fragments which range with fair uniformity between the size which will in any position pass through a 2½-inch ring and the size which will not pass through a ½-inch ring.

Test for Size

Maximum—A sample weighing not less than 150 lbs. shall be taken from the ballast as loaded in the cars and placed in or on a screen having round holes 2¾ inches in diameter. If a thorough agitation of the screen fails to pass through the screen 95 per cent of the fragments, as determined by weight, the output from the plant shall be rejected until the fault has been corrected.

Minimum—A sample weighing not less than 150 lbs. shall be taken from the ballast as loaded in the cars; weighed carefully and placed in or on a suitable screen having round holes ½ inch in diameter. The screen shall then be agitated until all fragments which will pass through the screen have been eliminated. The fragments retained in the screen shall then be weighed and if the weight is less than 95 per cent of the original weight of the sample, the output of the plant shall be rejected until the fault is corrected.

Handling

Broken stone for ballast must be delivered from the screen directly to the cars or to clean bins provided for the storage of the output of the crusher. Ballast must be loaded into cars which are in good order and tight enough to prevent leakage and waste of material and are clean and free from sand, dirt, rubbish or any other substance which would foul or damage the ballast material.

Inspection

Inspectors representing the purchaser shall have free entry to the works of the manufacturer at all times while the contract is being executed and shall have all reasonable facilities afforded them by the manufacturer to satisfy them that the ballast material is prepared and loaded in accordance with the specifications and contract.

In case the inspection develops that the material which has been or is being loaded is not according to specifications, the inspector shall notify the manufacturer to stop further loading and to dispose of all cars under load with the defective material.

As the quarry deepens or is enlarged further tests shall be made of the material wherever conditions indicate a change in the quality of the stone, or where in the judgment of the engineer for the company a further test is advisable. Should such tests show that the stone fails to meet the provisions of these specifications, it shall not be used for the manufacture of ballast.

Measurement

Ballast material may be reckoned in cubic yards or by tons, as expedient. Where ballast material is handled in cars, the yardage may be determined by weight, after ascertaining the weight per cubic yard of the particular stone in question by careful measurement and weighing of not less than five cars filled with the material, or the tonnage may be determined for subsequent cars by measurement and converting the yardage into tonnage by use of the weight per yard, as determined above.

Modernizing a Cement Plant

Missouri Portland Cement Company Has Made Many Changes in Original Plant

AN INTERESTING EXAMPLE of a cement plant which has been rebuilt and made modern by its present owners is the Prospect Hill plant of the Missouri Portland Cement Co., whose main offices are in St. Louis, Mo. This company, which was formerly the Union Sand & Material Co., was primarily a sand and gravel plant operator, but at present also owns and operates two large portland cement plants—one near Kansas City and this one near St. Louis.

Among the changes made in the last few years to bring the Prospect Hill plant up-to-date has been the installation of electric motor drives throughout the mill. The old line shaft drives have been torn out and individual motor drives installed for each machine or group of machines. The centralized power house with its large steam engines is now replaced by a very modern switchboard room where the power supply to each part of the plant is controlled. A panel is provided for each department so that an exact check of the power consumption of each department is defined by individual meters. A new machine shop, a store room and additional clinker and finished cement storage space have also been added.

The quarry from which limestone is produced is located nine miles from the cement works on the Chicago, Burlington and Quincy R. R.

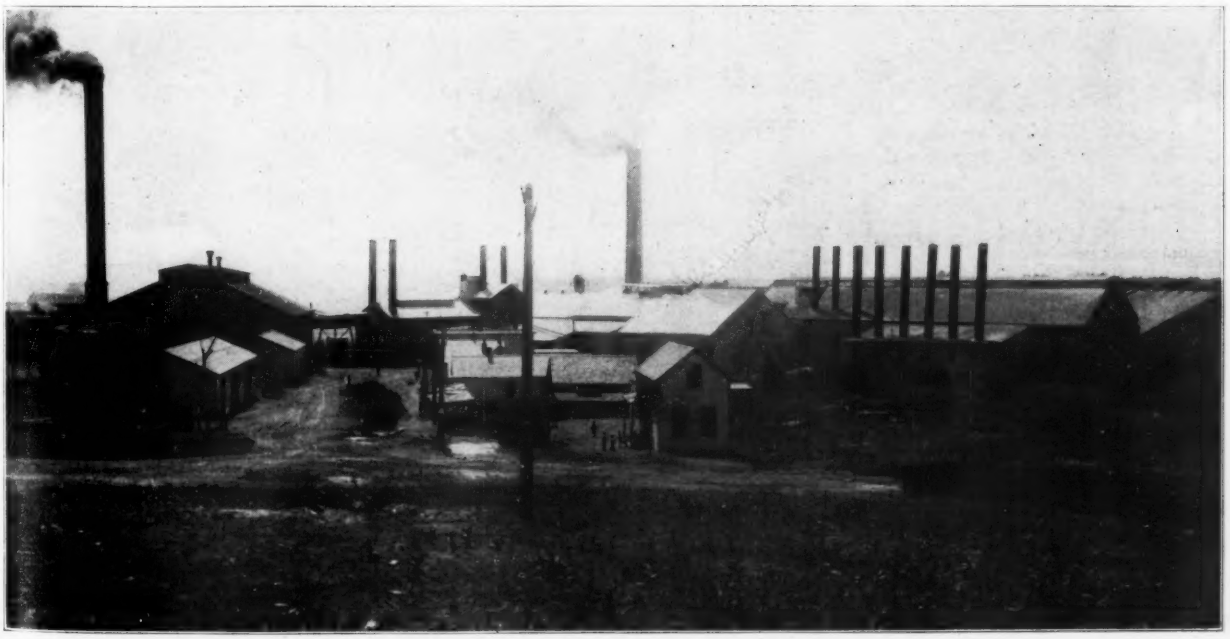
The cement company owns 30 standard railroad cars which are used to transport the material. A special arrangement has been made with the railroad whereby a locomotive and train crew is rented by the day for the work and a certain freight rate is paid for the use of the right-of-way.

Shale quarry, showing overburden and method of operation

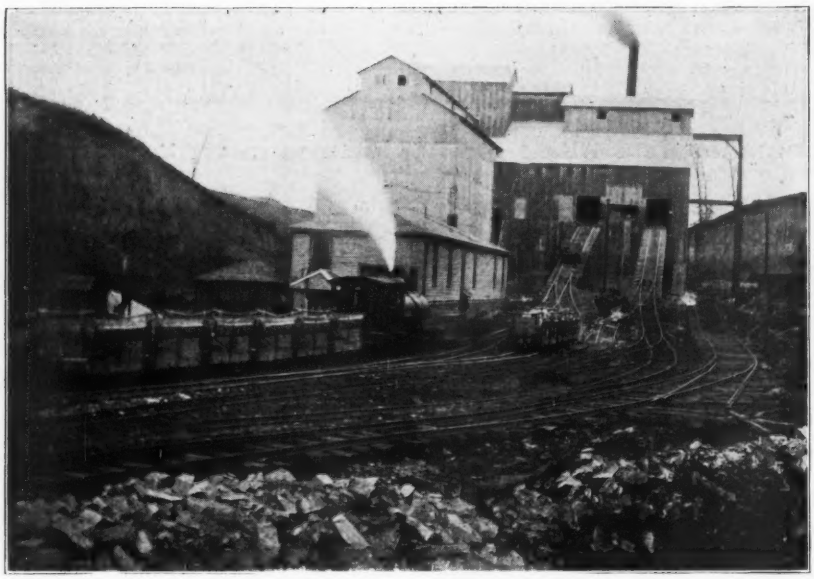
Quarry Operation

Several views shown here will give some idea of the quarry operation. The face is 60 ft. and the overburden is 40 ft., being a thick gumbo soil which is removed at a surprisingly low cost by hydraulic methods. The location, being near the Missouri River, affords an unlimited supply of water at low cost.

The whole depth of the quarry face is worked in one operation. Well drills are used in drilling for the blasts, but



View of the Prospect Hill plant of the Missouri Portland Cement Co.



Quarry side of crushing plant

owing to the presence of clay pockets the drilling practice varies for different parts of the face. More will be said about the character of the stone under control of mix.

A 100-ton shovel is used for loading the stone into end-dump narrow-gauge cars. An 80-ton steam shovel is also maintained as an extra or for use in case of emergency.

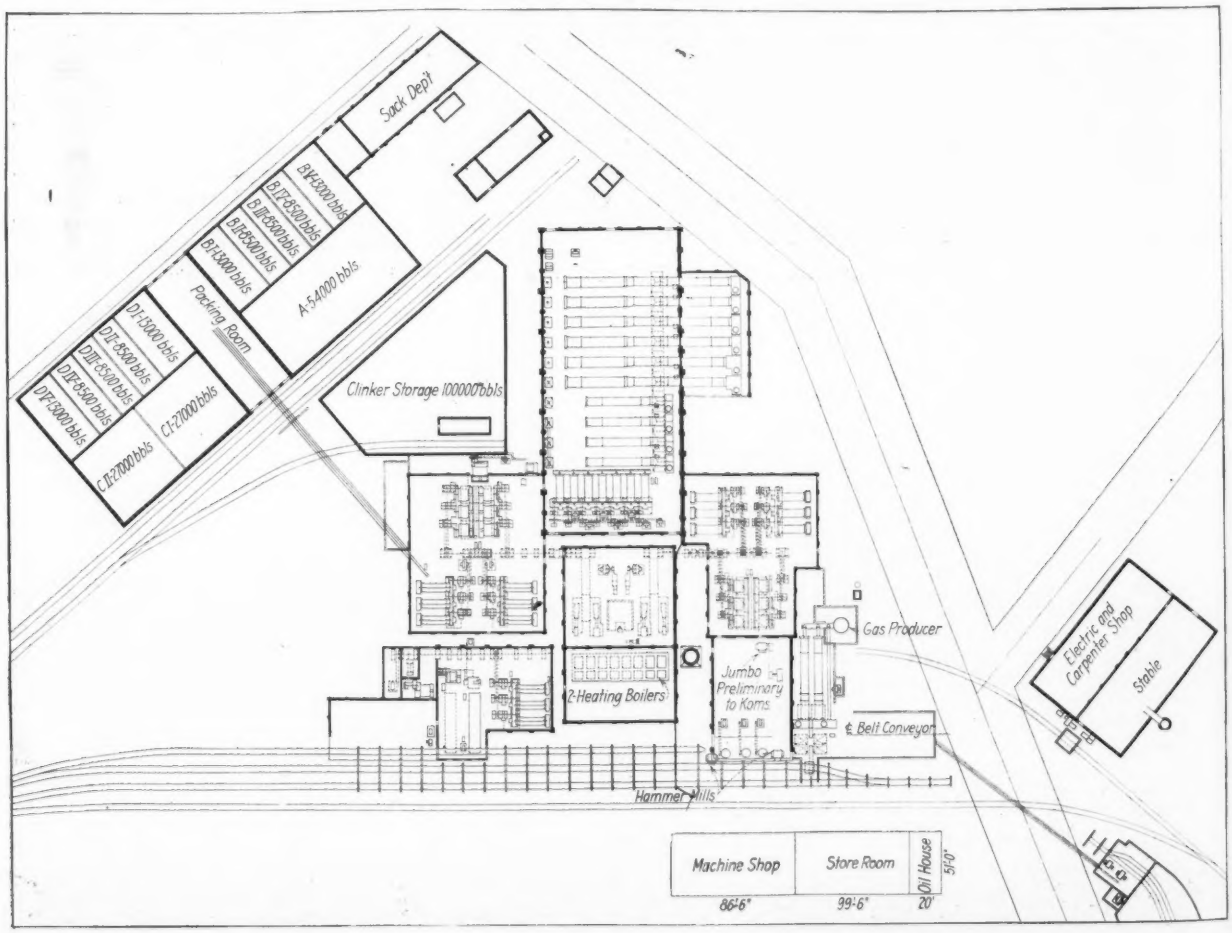
A 42-in. gyratory crusher reduces the run-of-quarry to about 8-in. size and under. This stone is then directed to a 2,000-ton storage bin as an intermediate between the crushing plant and the cement works.

A 36-in. conveyor is mounted on tracks so that it may be moved along over the storage bins and thus get a nearly uniform distribution of stone.

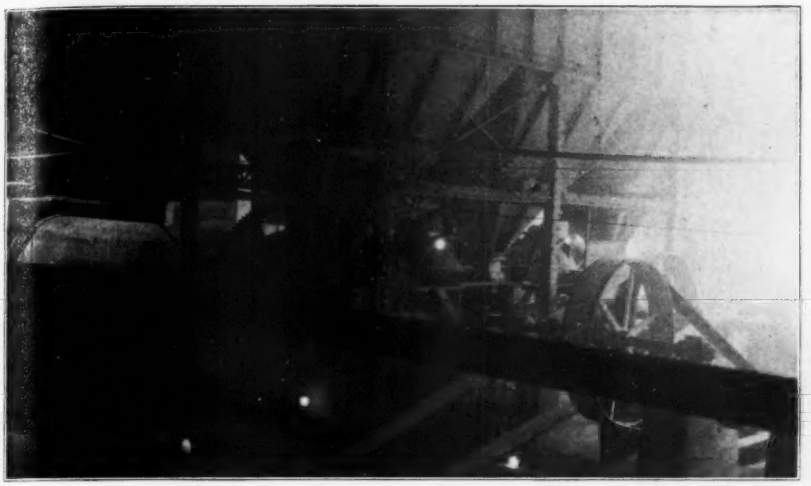
Handling Raw Materials

Storage at the plant is also obtained by the thirty 100,000-ton cars which the cement company owns. Sufficient yard space is provided so that the stone may be brought down in trainloads and moved up to the secondary crushers as needed. The locomotive and crew is often used for switching empties or loaded cars from the packing house.

The shale is obtained from a quarry close to the mill. After the 30 to 35 ft. of overburden has been removed by a steam shovel and wasted by the use of a narrow-gauge track and car operation,



Layout of the plant—It is interesting to note the number of improvements recently made, as indicated by the dotted lines



Battery of tube mills, showing drive and feed bins

the shale is shot down and loaded by steam shovel into side-dump cars. These are handled by horses to the foot of the incline to the crusher. After being crushed by two hammer mills, the material is sent to the mixing bins.

The secondary crushing of the limestone is done by three No. 5 gyratory crushers and two jumbo hammer mills. The shale and limestone are mixed before drying.

Control of Mix

Because of the clay pockets in the limestone which make the analysis of limestone variable, the preparation of a proper mix is an interesting problem. This is handled by D. F. Schulzke, chief chemist, in the following manner with very satisfactory results:

The limestone from the quarry is the variable quantity, whereas the shale is a fairly constant factor. The shale quarry face is stratified into three distinct layers; the upper layer, which is richest in silica and which is blue, is called the "upper blue shale." The section through the middle which is just about the correct proportion of aluminum, iron and silica, because of its red tint, is called the "upper red shale." The lower part of the face is richest in iron and aluminum and is called the "lower blue shale."

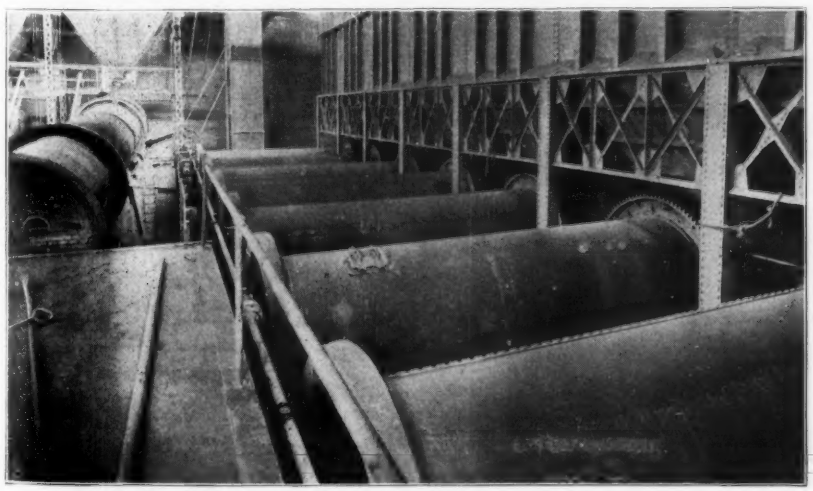
In keeping the mix uniform the ratio of iron and aluminum against silica is the argument worked with. The limestone is variable because of the variation of the amount of clay in it. The ratio of the iron and aluminum to the silica content of the clay is constant, however, being from 3.3 to 3.5. The first step is therefore a knowledge of what part of the deposits are being worked.

As the amount of clay in the limestone increases the ratio of these three elements increases and so the shale added must have a low ratio. As the clay in the limestone decreases the ratio in the shale must be increased.

View of kiln room, taken from firing end

The second adjustment of the mix is therefore at the scales where the ratio of shale and limestone may be varied. The limestone is a constant factor on the scales and the shale is varied. The ratio being approximately 2,000 lbs. of shale to 9,900 lbs. of limestone.

Samples of the material are obtained each hour after the preliminary grinding and again after the final grinding in the ball-mills. An automatic sampler gets an average sample of the hour's run. Because of the incomplete mixing in the preliminary grinding, but little weight is placed on the results of the sample taken there—that is, it is used merely as an indicator. If the final sample is not changing and the preliminary samples do run high, then low, the mix is not changed. But if the preliminary sample shows a consistent high or low analysis



Spare tube mills to be used either on raw or finishing end

The crushing plant at the quarry

Removing 60 ft. of overburden by hydraulic method

The stripped quarry face

A large blast

View after blast, showing quarry

Steam shovel quarry operation

the final sample will start to either rise or fall and the mix is readjusted by changing the amount of shale. Experience has made it possible for the chemist to often anticipate changes of mix by watching the shale and limestone as they come from the quarry.

The mixed limestone and shale is fed into two gas-fired driers. The two driers are supplied with fuel from one gas producer and, according to the experience here, it is found that the gas producer is much more satisfactory than the coal-fired driers.

Manufacturing Process

The preliminary grinding is effected by six No. 66 kominuters and the final grinding by six No. 16 tube mills. An extra battery of seven tube mills is provided for use either on the raw or finished end, as may be desired.

Burning is effected in three 60x6-ft., two 126x7 ft. 6 in. and four 125x7 ft. 6 in. kilns. The kilns have a combined capacity of 3,500 barrels per day. They are coal burning. The small kilns are some of the old installation.

Clinker Storage and Handling

One of the features of the recent improvements is the clinker storage, which has a capacity of 100,000 bbls. (of unground clinker). Three bucket-carriers are provided to put the material into the storage. Each carrier has an automatic tripper which may be moved along to distribute the clinker over the whole area. No clinker can be fed to the finishing mills without going through the storage. This removes the necessity for a clinker cooler.

The bottom of the clinker storage is of concrete, and is provided with gates and chutes so that the clinker may be fed to conveyor-belts. There are four such belts running at right angles to the lines of bucket-carriers and under the storage bin. Material fed by gravity to any one of these cross-conveyor-belts is delivered to a common belt and taken to the preliminary grinders.

In between the preliminary grinders

Battery of kominuters in raw grinding room

and the clinker storage is a device to add gypsum to the clinker. This consists of an automatic scale into which the clinker is run. When the scale beam is balanced it rings a bell and a given amount of pebble gypsum is added and the contents dumped.

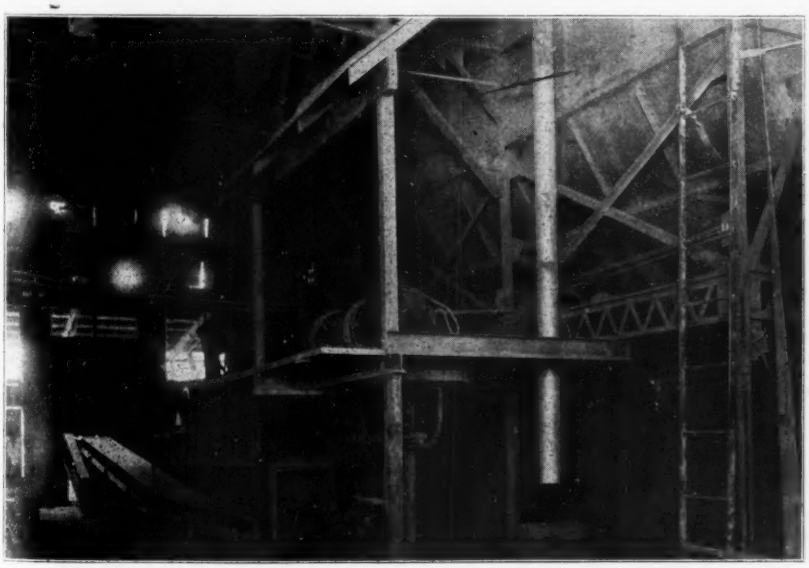
Preliminary grinding is done by six No. 66 and one No. 85 kominuters and the finishing is done by two No. 16 and four No. 17 tube mills. A part of the extra battery of tube mills in the raw side may be utilized for finishing grinding. The capacity of the finishing end of the mill is 4,000 bbls. per day.

The Packing House

Finished cement is sent to storage bins of 230,000 bbls. capacity in the packing house. Additional space has recently been purchased and concrete bins will be provided to store an additional 220,000 bbls.

The packing room is thoroughly up-to-date. Screw conveyors and scrappers are provided to remove cement from the storage bins and put it into the packing machine chutes. Four Bates valve bag machines of the four-spout type give a large sacking capacity. Belt conveyors are arranged so that as fast as the bags are dropped from the machine they are conveyed out to the car.

Cross conveyor for delivering to clinker storage



Packing room, showing arrangement of bins and packing machine

Handling Coal

Coal is delivered to the plant in hopper bottom cars and elevated to the driers from the reserve pile by buckets and elevators. The drier, which is coal fired, is 66 in. in diameter. Grinding mills consist of one No. 66 kominuter, one No. 7 ball mill—which is a spare—and three No. 16 tube mills.

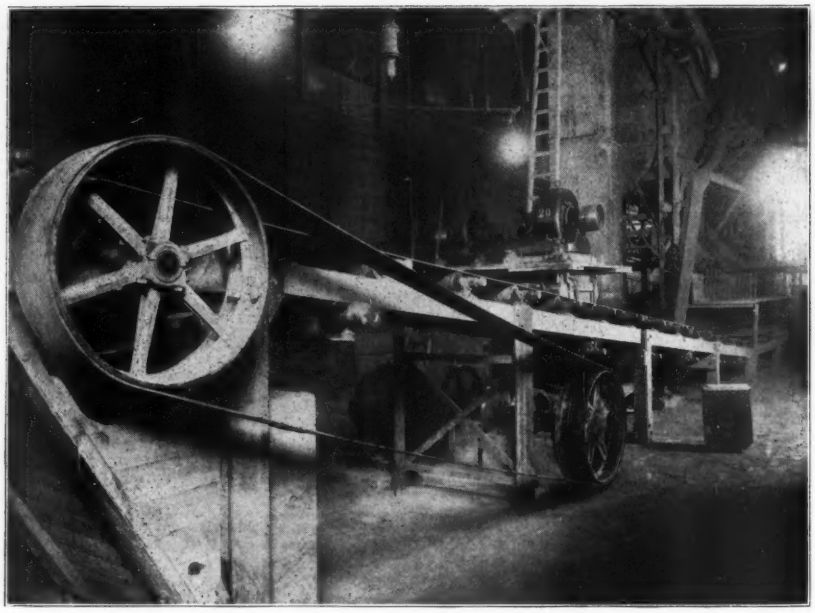
The dust in the grinding room is removed by a dust collection system.

Machine Shop and Store Room

Some of the latest additions to the plant are a machine shop and a storeroom. These are both in the same building. The machine shop has all machines incidental to cement plant repair. Its organization is capable of maintaining the high standard of efficiency of the plant at all times.

The storeroom consists of a warehouse where all spare parts and supplies are kept in a systematic manner—that is, shelves and sections are provided so that each part is recorded by a number and is issued and invoiced by that number.

The accompanying plan shows the arrangement of the machinery and equipment except that the motor drives are not located on this drawing. The old line shafts which have now been removed are shown in dotted lines, as are the old boilers and engine room. It is interesting to note the many improvements which have been made—any department shown dotted is old equipment and has been replaced. It will be noted that the logical sequence of the layout enables cement to be manufactured with as little handling as possible.



Conveyor to remove sacked material from packing machine

Accident Prevention

Aside from operation, the company is greatly interested in safety work. As soon as an accident occurs Superintendent George Ross goes out into the mill and takes a picture of the machine. The next day this picture and an explanation of how the accident occurred and how it can be avoided in the future is posted in parts of the mill upon specially provided bulletin boards. This practice prevails even in the case where the accident is only trifling, and it is the experience of the company that this method of teaching the employes how to avoid accidents has greatly reduced lost time. Mr. Ross is very enthusiastic about this plan.

The officials of the company are: H. L. Block, president; C. A. Homer, second vice-president; R. S. Colnon, third vice-president; Geo. M. Block, fourth vice-president; C. G. Besch, secretary and treasurer, and D. N. Armstrong, general manager.

New American Development of the Talc Industry

Manufacture of "Lava" from Talc

By Raymond B. Ladoo, U. S. Bureau of Mines

THE TERM "LAVA" was first used as a trade name for block talc, which has been subjected to heat treatment, but now it has come into more common use and is applied not only to block talc, but to articles made from a synthetic compound which may contain little or no talc.

The valuable properties of finished lava are great hardness and tenacity, resistance to high heat, resistance to acids and alkalies, high compressive strength, and high dielectric strength. It is harder than glass. It has a compressive strength of 20,000 to 30,000 pounds per square inch; is not affected by heat below 1100 degrees C; is unaffected by alkalies or acids except hydrochloric, which attacks it but slowly, and its dielectric strength is 75 to 250 volts per thousandth of an inch in thickness.

Lava is used in a great variety of forms for gas tips and burners, and for electrical and heat insulation. As all of the machining is done before the talc is baked, an almost infinite variety of forms may be made. Such forms are limited only in size, for articles not much over 12 inches in length can be made satisfactorily of true lava.

Talc suitable for the manufacture of lava must be fine grained, homogenous, compact, fairly soft, and lacking in cleavage, or cleavage must be very poor. It must contain little or no water, must be free from grit and low in iron. Massive talc for this use is found in British India, Italy, France, Germany, and the United States. One of the characteristics of the best talcs is that a surface, which has been scraped by a sharp knife, presents a semi-polished appearance. This is best exhibited by the Indian, Italian, and German talcs. Fineness of grain, and freedom from grit are essential if very small holes or slots are to be cut. The presence of iron as an impurity lowers the dielectric strength. Included moisture causes the talc to swell and split during the baking process.

Talc for lava manufacture is bought from producers either cut to size in small cubes or in large, roughly squared blocks 12 to 18 inches in diameter. As many of the shapes of lava are made to order, the large blocks are held in stock for cutting into special sizes. The small blocks, cut approximately to the outside dimensions of the finished articles, are placed one at a time in small, high speed lathes, where the preliminary cutting is done. They then pass to a succession of lathes, drills, and saws, where the blanks are turned, threaded, drilled, and slotted. After the machining is done, the lava in the green state is placed in small ovens or kilns, heated by electricity or gas. There, they are subjected to a temperature of about 1100 degrees Centigrade or 2000 degrees Fahrenheit for between 24 and 48 hours. There is practically no shrinkage in the baking process. This makes possible the manufacture of articles in which accuracy of size is important. After removal from the kiln, the lava articles are allowed to cool, and then are carefully examined and tested. Gas burner tips are usually mounted in brass or nickel plated holders.

Composition or synthetic lava is made from ground talc or other material mixed with a suitable binder. The resulting mass is thoroughly mixed and then formed under high pressure into rods, slabs, or tubes. These blank forms are first air dried, then kiln dried at a moderate temperature. The resulting material may then be machined and baked by the methods used for true lava. Composition lava is lighter in weight, and more porous than true lava, but is more suitable for some purposes than that made from massive talc.

While most of the best talc for lava manufacture in the past has been imported, it seems probable that domestic sources may be more extensively utilized in the future. Further research both in the field and in the laboratory should not only develop new sources of this grade of talc, but also new uses for lava.

Employers Getting Closer to Men

By B. C. Forbes

Industrial Democracy an Aid to Americanization Work

REMARKABLE PROGRESS is being made by large employers towards getting closer together with their workers. Probably more than a hundred corporations have negotiations under way to give employes direct representation in management.

The National Cash Register Co. has just held an election among the rank and file of its employes for the selection of twenty-five representatives to constitute the N. C. R. advisory board, which will meet with representatives of the management once a week, or at other frequent intervals, to co-operate in considering and handling all matters pertaining to working conditions of the 6,700 employes throughout the plant at Dayton, Ohio.

Swift & Company recently appointed a leader in this line of work, John Calder, to bring about closer relations between the company and its 60,000 workers. A start has already been made in the way of holding classes for employes with a view to educating them to take a real and intelligent part in the work of management as soon as conditions are ripe.

The industrial democracy system devised by John Leitch is in process of being installed at dozens of plants all over the country, while other organizations aiming to further the democratization of industry also report an avalanche of important applicants for their services.

Employes' Advisory Board

Here is the announcement which was made the other day to all employes at the National Cash Register Company:

"For a long time we have felt the need of advice and suggestions from the rank and file. We want to know more of your troubles. We want your counsel and co-operation more than ever before.

"It has been decided to organize an advisory board elected by the people in order that this may truly represent the rank and file.

"The plant has been divided into twenty-five voting divisions. A representative from each voting division will be elected by ballot. The twenty-five representatives so elected will constitute the N. C. R. advisory board. A person occupying the position of officer, head of a division, supervisor, foreman, assistant foreman, or job foreman in the factory, or occupying a similar position in the offices, will not be eligible for election as a member of the advisory board. Nor will any such person be entitled to vote. It is our desire that no such person shall have a vote in or influence the selection of the members of the advisory board.

"The object of this advisory board will be to bring the management and the rank and file closer together. We want to meet with people who represent the rank and file, and discuss questions of mutual interest, thereby helping to better the conditions of both the employes and the company.

"Vote for a candidate who will best represent your interests. Meetings of the advisory board will be called as frequently as once a week whenever there are sufficient subjects for discussion to justify calling a meeting."

The announcement was signed by President John H. Patterson, Vice-President J. H. Barringer and Secretary F. B. Patterson.

President Wilson's Industrial Commission has been inquiring closely into the operation of Leitch's Industrial Democracy. This plan and its operation were laid before the commission by a delegation consisting of Mr. Leitch, L. De K. Hubbard, vice-president of the Champlain Silk Mills of Whitehall, N. Y.; and C. C. Conway, president of the Conway Company, representing the Pathe Freres Phonograph Company, Simplex Piano Player Action, French Cabinet Company, and the Hallett & Davis Piano Company.

The members of the commission wanted to know whether these advocates of industrial democracy endorsed the commission's tentative plan for industrial courts.

Industrial Courts

Mr. Leitch cordially approved of this proposal, notwithstanding that it had been objected to both by Mr. Gompers and the head of an important association of manufacturers. Mr. Leitch declared that the strongest objection to such courts would come from those who had most to fear from them. He declared that it was his experience that there are just as many "reds" among capitalists, in proportion to their total number, as there are among workers, and that there is need for a police system for industry, so to speak.

Mr. Leitch went on to emphasize that elaborate efforts are now being made to "Americanize" immigrant laborers, and asked whether the introduction of a plan of democracy in industry, based on the democracy underlying the form of the United States Government would not do more than anything else to acquaint immigrant workmen with the ways and principles of this country.

Mr. Leitch further declared that, while he heartily agreed with the commission's proposal to establish industrial courts, he believed that the trouble should be attacked nearer its root. In other words, the aim should be to prevent the troubles which necessitated the calling in of courts. Courts necessarily were not creative or constructive or preventive. Measures should be instituted in each plant or works to take up threatened troubles in their very infancy.

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The Gist of the Labor Problem

AT THE RECENT CONVENTION of the Sand-Lime Brick Association at Buffalo, President W. H. Crume of Dayton, Ohio, said: "It seems that while the labor problem was most acute a year or so ago, some Saginaw business men were at some meeting, and in attendance was an official of a sugar-beet factory, located at Saginaw. Some one turned to the sugar man and asked him why it was that with labor short in all the other factories the sugar-beet factories had full forces of men, did not pay higher wages and only employed the men for four or five months in a year. The sugar man answered: 'You men have all been through our factories, now stop and try to remember if you ever saw a man *working at manual labor,* except possibly a repair man. We don't hire men *to work,* we buy machines to do the work and pay the men to watch the machines, to see that they are working. In other words, the job of watching something or somebody else work appeals to our common laborers, apparently being the goal of their ambition.'

"To illustrate this tendency, several months ago Joseph Lowes, a contracting engineer of Dayton, advertised for a large number each of bricklayers, carpenters, laborers, and *one night watchman;* according to Mr. Steiner, his office manager, they did not receive a single application for any except the watchman's job, and had 18 applications for that—the poorest paid job in the lot—and many of the applicants were then employed at jobs that paid much better wages. It sounds funny, but it's serious."

Utilization of Waste Granite

Experimental Manufacture of Brick with Lime Similar to Sand-Lime Brick

By Oliver Bowles, U. S. Bureau of Mines

WASTE IN THE GREAT GRANITE CENTER at Barre, Vt., consists of three types of material, the rough blocks rejected at the quarries on account of imperfections, the chips or spalls resulting from trimming and dressing at the cutting plants, and the granular and pulverized material from the dust collectors. The waste piles at the quarries are of immense proportions and constitute a serious handicap to quarrying in that they cover up good rock deposits and are also so large that waste disposal becomes more and more expensive. The problem of utilization of such waste material is a topic of keen interest to all granite producers.

Barre is not situated on a water route and thus transportation costs prohibit the shipment of waste blocks for rip rap or ballast. Crushing plants use a small amount of this material for road construction, but aside from this the waste is practically valueless.

"Sand-Lime" Brick

Investigators of waste utilization problems are awaiting with interest further information concerning an enterprise undertaken at Montpelier, Vt., to utilize crushed granite for the production of brick similar to sand-lime brick. Granules of granite are mixed with lime, moulded and hardened under steam pressure. The brick produced are said to be of excellent quality for structural purposes.

There seems to be no logical reason why waste granite could not be utilized for the manufacture of building stone and paving blocks, for many of the defects which condemn a stone for monumental purposes are not at all detrimental for building or street paving. For the most part, monumental stone workers are not particularly interested in other branches of the granite industry and a combination of industries such as that suggested above has not appealed to them.

Possible Use of Feldspar

There is a considerable content of potash in Barre granite, as in all granites in which orthoclase is the predominating feldspar, but as the potash is present in silicate form, it is difficult to separate. Many patents have been taken out for the recovery of potash from feldspar, but operation on a commercial scale is yet in the future.

A process of mechanical separation of mica from granite dust and utilization of the remaining mixture of quartz and feldspar in the ceramic industries is now in the experimental stage.

Pulverized granite may be used in abrasive soaps, for poultry grit and as filler in such products as roofing and fertilizer materials, but markets that consume any considerable quantity of granite for such purposes have not yet been established.

While the problem of utilization of waste granite is at present largely unsolved, there are evidently a number of avenues for useful application of the materials that bear sufficient promise of their utility to justify careful consideration and study. Suggestions regarding any phase of the problem of waste granite utilization will be welcomed by the Bureau of Mines.—Monthly Reports on Investigations, U. S. Bureau of Mines.

Important U. S. Court Decision on Association Practices

Legality of "Open-Price Competition" Brought into Question by Memphis Case Against Hardwood Lumber Manufacturers' Association

JUDGE McCALL, United States District Judge at Memphis, Tenn., has just rendered an important decision in the suit of the Government under the Sherman Act against the so-called "Open-Competition Plan" of the hardwood lumber manufacturers who are members of the American Hardwood Manufacturers Association.

The Government showed in this case that the members of the "Plan" continuously exchanged with one another, through a common secretary, reports showing their respective rates of production and stocks on hand, and also showing the prices which each member had received on actual sales of lumber.

It was established that the tendency of such an interchange of information amongst the defendants was to increase their prices, as the Government had charged. Nevertheless, the defendants contended that they were entitled to exchange the reports in question, which were referred to as "Market Information."

Notwithstanding the affidavits of practically all of the defendants that there had been no agreements between them to increase prices, Judge McCall held that:

It cannot be with reason denied that defendants formed a combination to promote the interests of the members of the plan by maintaining price levels and it is difficult, if not impossible, on this record to escape the conclusion that the purpose and intention of the plan was to suppress competition among its members in the hardwood lumber manufacturing business wherein the production of hardwood lumber was to be kept low enough to maintain prices on an ascending scale, but not so low as to drive prices to such heights that consumers would be induced to use substitutes. These two objectives mark the margins of the channels through which the members of the plan conducted by its manager of statistics were to steer interstate commerce in hardwood lumber and through which it was successfully steered on up to the filing of this bill;

He enjoined the defendants from continuing to exchange the reports in question.

This proceeding was of a civil character; but the Department of Justice considers that the law as applied in the case is clearly established. The members of other corresponding organizations will not be considered by the Department as entitled to conduct similar operations in future because they may have filed papers at Washington, or because of other similar reasons; and the Department will, if necessary, institute proceedings of an appropriate character to enforce the law.

Reduced Rates for Gravel Shipments

REDUCED RATES effective February 29, on distance basis on shipments over three lines of sand, gravel and crushed rock were authorized by the U. S. Railroad Administration, according to word received by the Montana Railroad Commission.

The new rates give an average reduction of 29 per cent on one-line hauls, 39 on two-line hauls and 48 on three-line hauls. The rates were sought by the state commission at the request of the highway commission, in an effort to reduce road building costs.

Labor-Saving in Sand-Lime Brick Manufacturing Plant*

Pulverizer That Mixes Too; Removable Truck Body for Handling Brick

By W. H. Crume
Crume Brick Co., Dayton, Ohio

FOR several years I have been trying to buy a pulverizer that would pulverize both our sand and gravel at a reasonable cost for power and repairs, intending to use it before the material went to the wet pans.

The pulverizer manufacturers almost without exception shied at our proposition after receiving samples of material until I got into touch with a company making a grinding mill that has until this time been used exclusively in the mining industry, and I became very much interested in this mill, due to the results obtained in pulverizing various ores. Early last year I called on the manufacturers, now known as the Marathon Mill Co., and told Mr. Johnson, the manager, our problems; he not only assured me that his mill would do the pulverizing, but almost insisted that we use it also as a mixer for our lime and sand while grinding.

This mill is a cylinder weighing about 25 tons, 48-in. diameter by 9 ft. long, with about nine tons of steel rods of varying diameter, ¼-in. to 1½-in. diameter, these rods tumbling and revolving as the cylinder is turned, and the rods grinding throughout their length.

I believe, or rather I have convinced myself, from data on grinding ore, that this machine will do the work, at present done by two wet pans, and with a power consumption of one wet pan, and give us a much better mix, and I will be sorely disappointed if it does not do so. A great deal of labor saving is to be worked out contingent on the satisfactory working of the Marathon mill.

Improvements in Brick Machine

In the pressing department we have installed a speed change machine, connected to one press, for use in breaking in new press hands, this change when connected gives a latitude in speed of from 8-24 impressions per thousand, without affecting the speed of the other press or machinery.

We have also contemplated installing a plunger lift, with a ball-bearing turntable as the platform, and running our tram cars onto this platform, raising it about 20 in., filling two rows to half their height, reversing the car, and filling the other rows, then lowering the car to floor level, and finishing the car; this would eliminate the bending and stooping over and lighten the press man's effort about 35 per cent. We have a design for such a lift that we think will work out, but as we are for the time being not short of press men we are putting this off until later.

Loading Brick

The next step is the loading of brick into trucks, cars or stock pile. We have not been able to decide as yet just what promises the best results, except that the hand or manual operation must be eliminated. We do, in loading box cars and some types of gondolas, run our tram car onto a transfer car and this transfer car into the railroad car, then with short portable sections of track the tram car is run to the end of the railroad car, and unloaded by hand, eliminating either the carrying from the door to the end of car, or as compared to the gravity conveyor one man, as one man can do all the unloading from the tram car placed inside the box car.

By far the greatest proportion of our brick are now moving by motor truck from our factory, due to the arbitrary 40 cents per ton advance, made by the U. S. Railroad Administration in June, 1918.

Motor Truck Freighting

It is my conclusion that brick loaded onto motor trucks, wagons, open cars or stock pile should be done by means of a power crane, picking up a tram car as a unit. This immediately shows up the tram car as now loaded as being an inconvenient load to handle, and it seems to me that some type of car or loading of same must be developed to lend itself better to power handling. There is a type of truck body now on the market that will, I believe, work in ideally with our loading; this is the Fountaine steel body made by the American Body Co., Martinsville, Va. These truck bodies are made in two sizes for one and two thousand brick. The two thousand size, as I remember it, is 56 in. wide, 80 in. long and 37 in. high.

I think our tram cars could be cut from 64 x 36 in. to 56 x 36 in., and then by detaching the deck from the running gear and putting smaller diameter wheels on the running gear, the tram cars could then be loaded into rows of twenty-five 2¼-in. brick, four rows and 10 brick high, tying each of the four rows by cross piling instead of breaking joints. These tram cars would then approximate the size of the truck body; that is, two tram car decks will fill the truck bed except about 11 in. in length, and this could be taken care of by filling the front end to make this allowance, and the 10 brick high would be either 40 or 38.5 in., depending on whether the brick are 4 or 3¾ in., plus the 4 or 5 in. of the tram car deck; this, I believe, could be overcome either by having the bodies made that much higher or by riveting, say, 6 in. onto the sides. The great advantage would be in eliminating all the manual labor of loading (except in box cars) and unloading at the job.

This same principle could be applied to stacking brick in the yard, picking up the truck body with a light type of traveling crane, such as the "Peerless" or "McMyler," piling the brick in the yard on their pallets, and if stiff pallets were used on the ground course, they could be piled 2 or 3 tiers high, and later picked up by the crane from the pile and loaded onto trucks or open railroad cars.

*From a paper read at the recent Buffalo convention of the Sand-Lime Brick Association.

New Slate Products Industry in New York State

W. A. HUPPUCH of Hudson Falls, N. Y., has been chosen president of the Red and Green Slate Products Co. of Granville, N. Y. The company has been formed for the purpose of supplying a ground slate product known as granule, to be used in making unfadable red and green shingles, linings for bungalows and various other building and similar purposes, and also to quarry and manufacture slate.

The dust of the ground slate can be used for paint, linoleum, oilcloth and other articles. It is stated that the company's entire output has been practically contracted for. Work on the new plant has been commenced and it is expected to have the building ready for occupancy by May 1. John Bolton, Jr., of Troy is general manager of the new concern.

End of a half-mile tunnel at three portals in quarry pit

Famous Massachusetts Lime Plant In the Berkshire Hills

Farnam-Cheshire Lime Company Operates Some of the Oldest and Some of the Latest Types of Shaft Kilns—Combination Fuel of Wood and Coal—Unique Quarry Operation

AN OPEN-PIT QUARRY with a half mile tunnel entrance through the base of a mountain is the unique operating condition at the works of Farnam-Cheshire Lime Co., Farnam, Mass. The plant is located on a spur of the Boston & Albany R. R. between Pittsfield and North Adams, and the quarry is located on the far side of a hill or mountain, 500 ft. in height, about four-fifths of a mile distant from the lime plant.

A narrow-gauge railway connects the quarry with the lime plant. About a half a mile of this railway is in a tunnel through the base of the hill already referred to. Formerly the stone was brought over the hill on an aerial tramway.

Quarry

The limestone is a very pure grade of coarsely crystalline rock—practically a marble. It contains a very small percentage of silica, alumina, and iron. The results of some analyses by W. Bradley Thompson of the department of geology, Williams College, are as follows:

	1	2	3
Silica	0.61	0.08	0.55
Alumina and iron	0.42	0.13	0.15
Lime (oxide)	55.42	55.65	55.71
Lime carbonate	98.96	99.28	99.46

The rock is blueish-gray in color, hard, compact and very uniform throughout. The only visible impurities are occasonal crystals of iron pyrites and some sericite mica. No quartz veins occur.

The present quarry opening is a hole back of the mountain about 400 ft. across and 140 ft. deep. The quarry is situated on the west side of a hill. The natural drainage was sufficient to carry off the water until the operation reached such a depth that the water collected in the pit. Then pumping had to be resorted to.

As the working got deeper, springs were encountered and the drainage problem became very serious. The owners of the property "took the bull by the horns" and solved the drainage problem and the transportation problem once and for all by driving a tunnel through the dividing ridge. A second tunnel driven part way into the ridge taps a large spring and keeps the main transportation tunnel moderately dry. It is expected to continue this into the quarry and thus provide a second track. The present quarry working extends 140 ft. below the former surface and no trouble is now experienced with drainage.

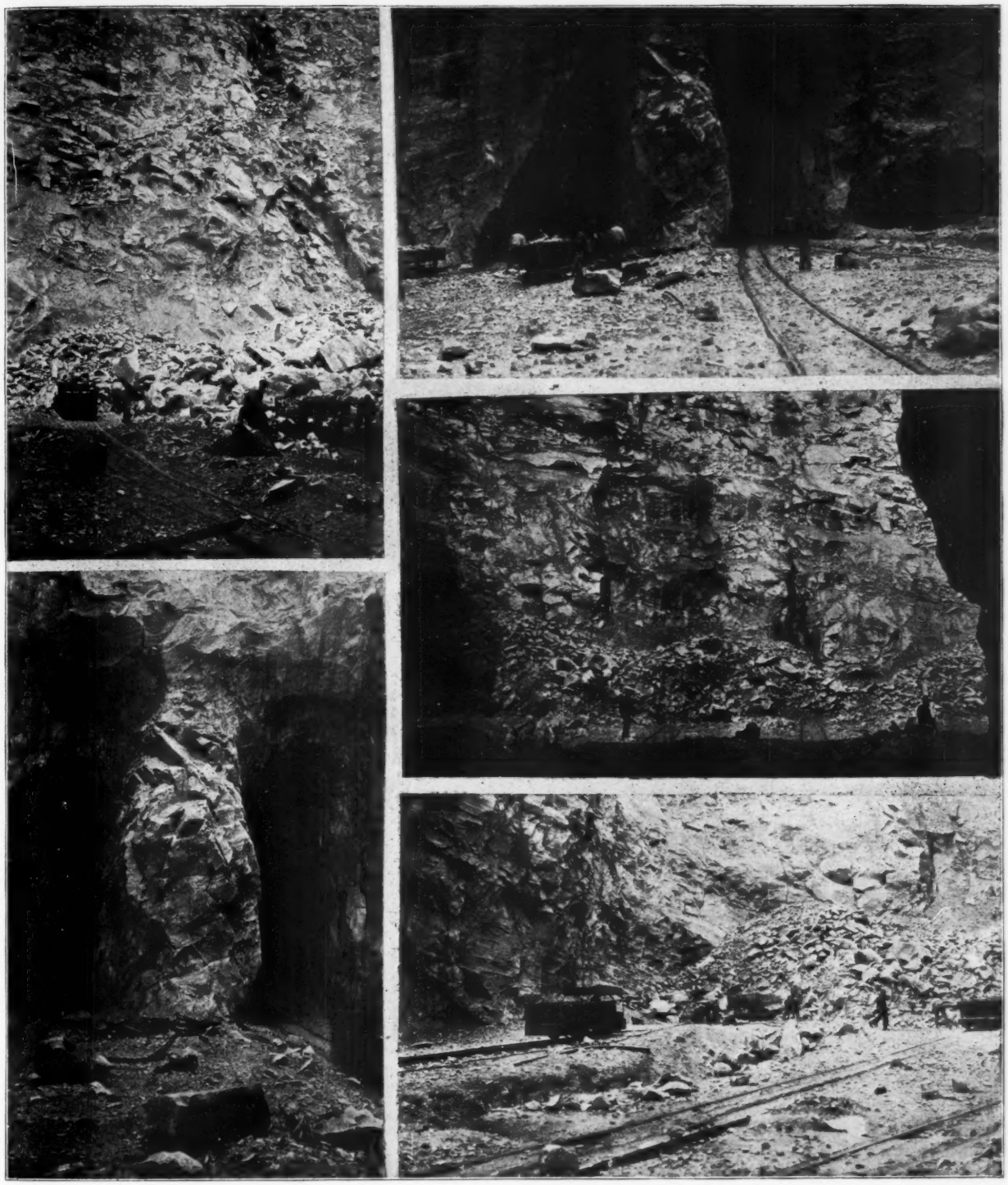
The extent of the limestone deposit is not known. To the east it is penetrated for 200 ft. by the tunnel. The most of the overburden is only about 5 to 10 ft. and is removed by carts and teams. All except the top 5 or 6 ft. of ledge is very nearly pure calcium carbonate.

The tunnel opens into the base of the quarry through three portals, as shown in the view at the head of the article. At present the opposite or west side of the quarry is being worked, but eventually the 200 ft. of stone on this side of the quarry will also be removed.

The tunnel itself is 12 ft. wide, 8 ft. high and is 2,300 ft. long. It penetrates schist for about 2,100 ft. from its east (plant side) portal. Great difficulty was encountered in driving it and the greater part of the tunnel had to be timbered. It cost something like $12.50 per linear foot.

There is a down grade in the length of the tunnel of 40 ft., which makes ample provision for drainage and makes it possible to remove the stone in large train loads with small gasoline locomotives.

The tunnel is electrically lighted. Two trains are operated on the narrow gauge railway between the plant and quarry. The locomotives come up grade from the plant pushing trains of six quarry cars, switch the cars on a fan-shaped track layout in the quarry and collect strings of six loaded cars on the outgoing track. Passing tracks are provided just beyond the quarry portal, so that a string of empties is brought into the quarry just as the loaded cars leave. It takes about an hour for a round trip



Quarry views of the Farnam-Cheshire Lime Co.—A very pure high calcium limestone deposit in the Berkshire Hills of Massachusetts

of a locomotive to and from the kilns.

The stone is quarried by compressed-air operated hand hammer drills and small blasts. The confined area and high rugged face do not permit the use of deep-hole drills and heavy blasting. The rock is picked up and loaded by hand labor paid by piece-work system.

The drill holes are 6 to 12 ft. deep and the dynamite charge varies from 6 to 10 sticks per hole, depending on the amount of rock to be loosened. An ordinary blast loosens 2 to 3 tons of rock. The blasting is generally done at noon and at closing time at night. Quarry spauls are sold for fluxing stone.

A full quarry gang is 35 to 40 men. The laborers are mostly Italians, although some negroes are obtained. Living quarters are provided for them on the side of the hill toward the plant,

Extreme left is the new plant of four Mount kilns—In the center is the battery of 18 coal

amid scenic surroundings that New York millionaires spend a lot of money to attain—a little farther south in this same Berkshire Hills country.

Lime Plant

The old plant, shown in the center-page view, had 18 kilns of various diameters and heights. All were originally wood fired. As at other New England plants, the operators clung to wood fuel exclusively as long as it was available in sufficient quantities. After coal was introduced combinations of wood and coal have been tried in hopes of preserving some of the good features of the wood fuel. The present fuel is one part of coal to three of wood.

The kilns have capacities ranging 60 to 100 tons of limestone each. They are of the usual continuous type. The kilns are steel jacketed, lined with firebrick and clay. The average height of these kilns is 30 ft. and the diameters vary from 6 to 8 ft. The average capacity of these kilns is 60 bbls. of lime per day, about 72 hours being required to completely calcine a kiln of limestone.

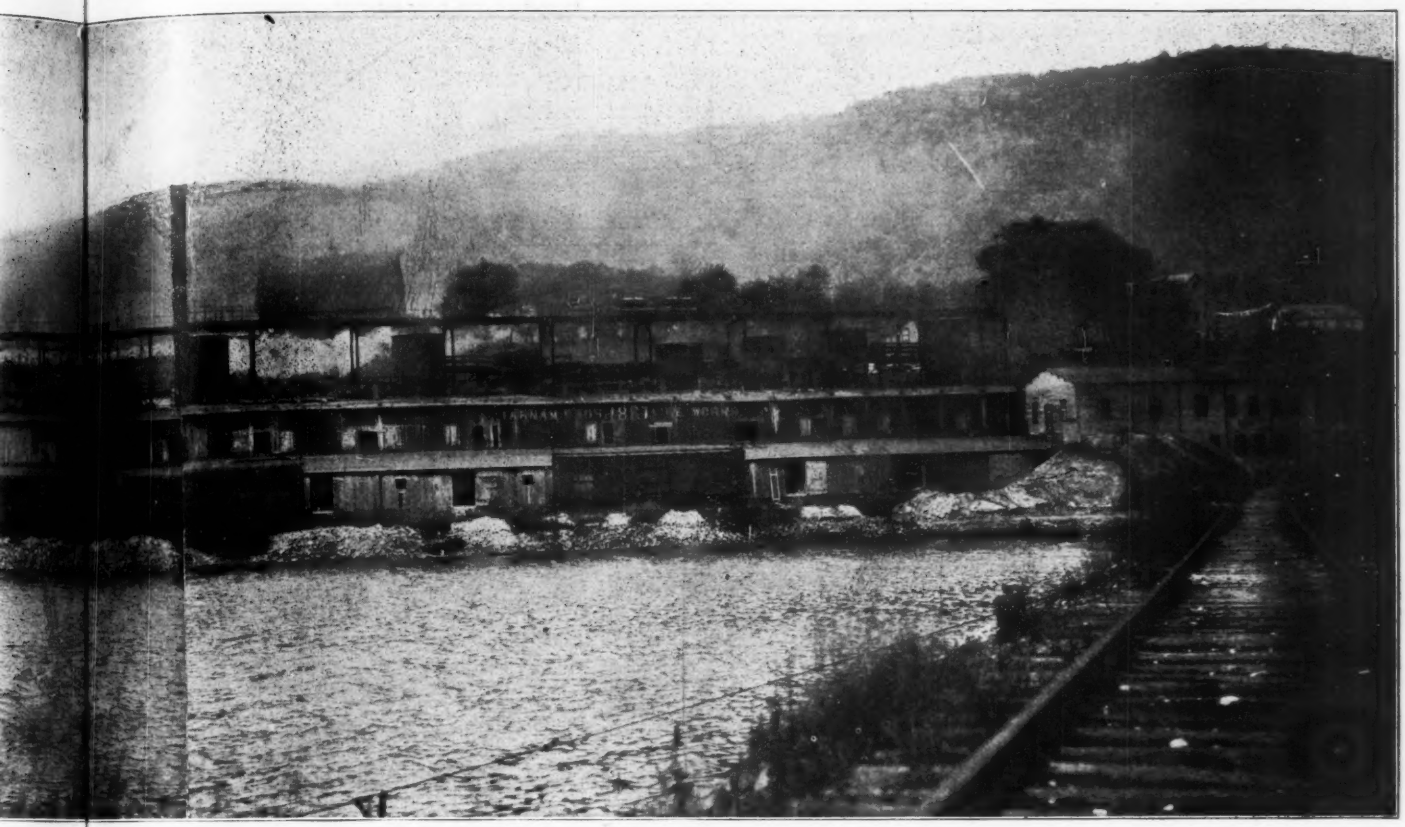
This plant also is claimed to have made the second installation of gas producer firing in America. The three kilns at the extreme left of the view (south) are fired with a single Morgan gas producer, installed nearly twenty years ago. Like many of the other earlier gas-producer installations, much trouble is had with soot collection in the delivery pipes. These have to be cleaned out every day and are blown out with compressed air twice a week. Steam is used on these kilns for forced draft. The fuel ratio is about three pounds of lime to one of coal.

Entrance of tunnels to quarry from the plant (east) side of the dividing ridge

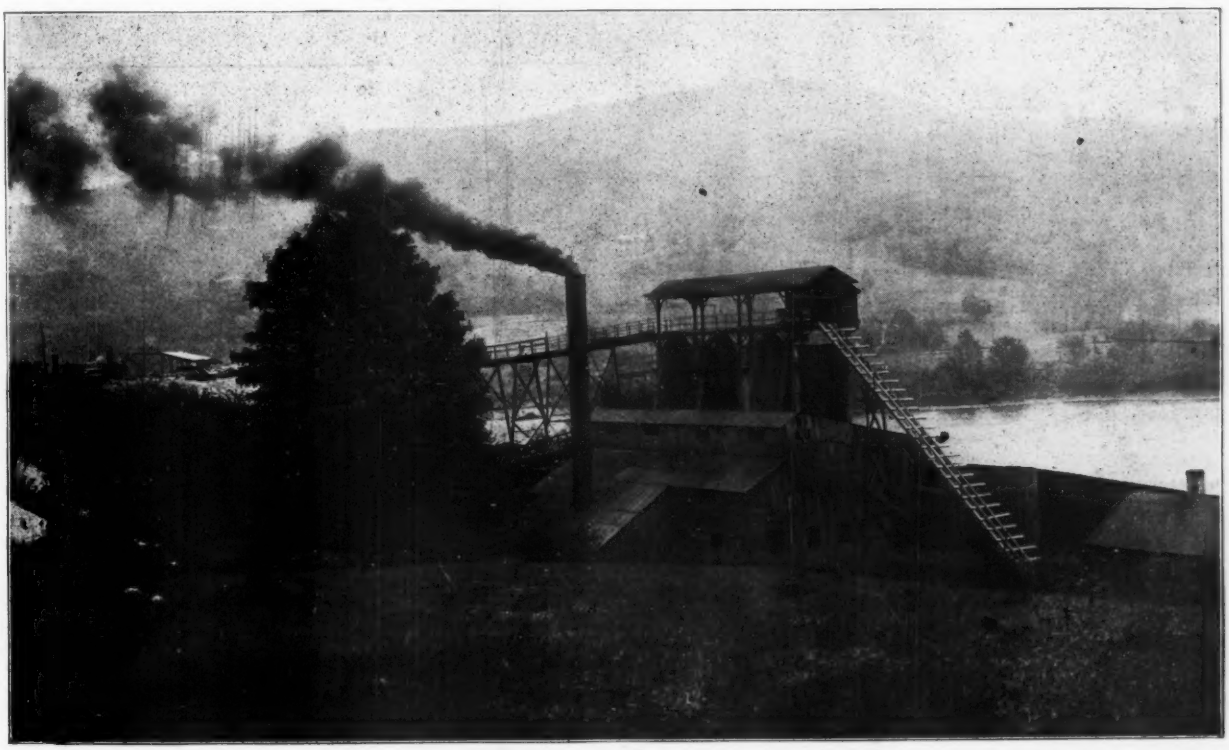
New Continuous Draw Kilns

To the south of the older lime plant is an entirely distinct one, built in 1914. This plant has four Mount kilns of the continuous-discharge gas-fired type, described by their designer, W. D. Mount, in Rock Products, April 12, 1919. These four kilns are fired by two Morgan gas producers.

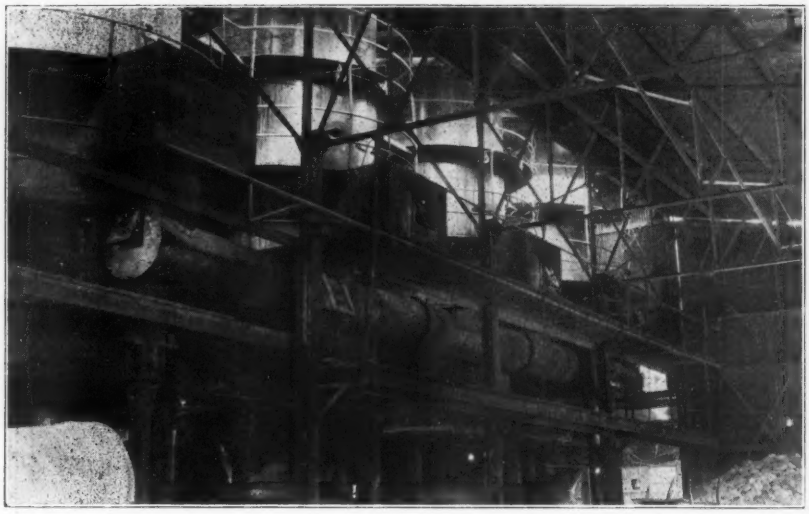
The gas producers are fed from steel bins and the frame and appurtenances of the kiln building are also of structural



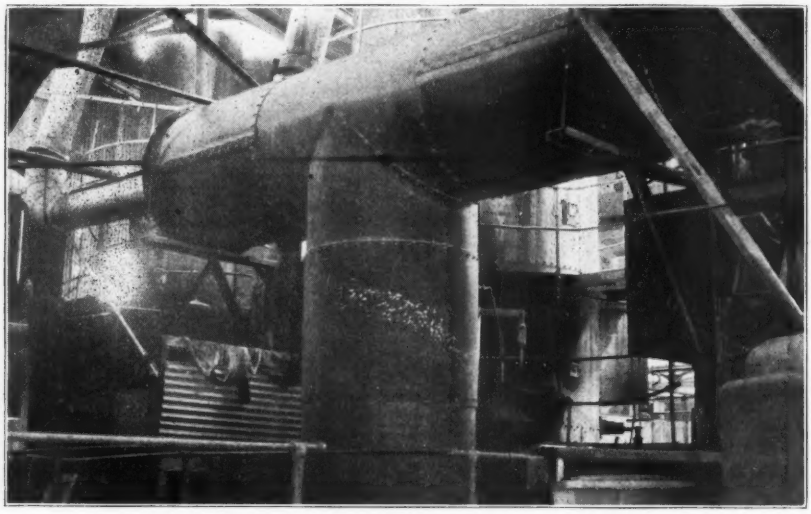
the battery of 18 coal and wood-fired kilns—Quarry is beyond the ridge in the background



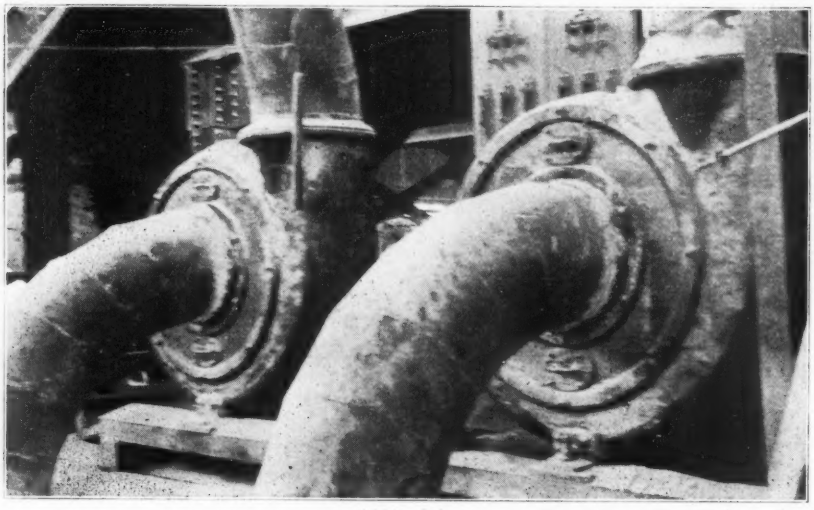
Near view of the Mount kiln plant erected in 1914



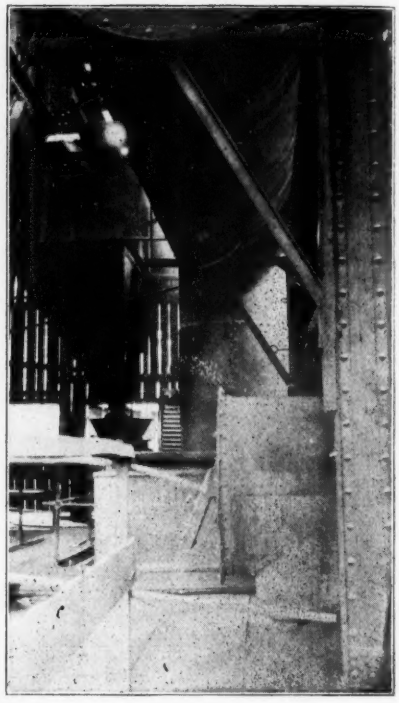
Structural details of the Mount kiln plant



Induced draft piping



Suction fans on draft system



Gas producer and main

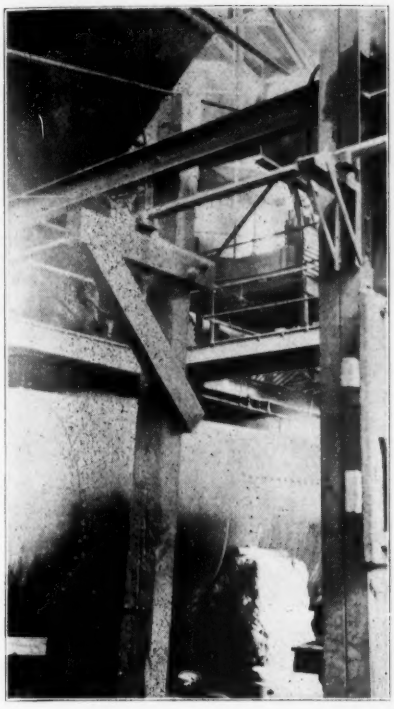
steel. The accompanying views give a very good idea of this plant, which is reputed to be one of the most efficiently operated in this country. It makes the best quality of lime with a fuel ratio of from 5.4 to 6 pounds of lime to a pound of coal, year in and year out.

These kilns are divided into three sections, from top to bottom, a preheating zone, a burning zone and a cooling zone. The burning zone is encircled on the outside of the kiln with two steel platforms which give access to two rows of peep holes in the kiln walls. The lowest, or third, tier of peep holes is accessible from the firing-floor level of the gas producers.

Gas is admitted from the producers to the burning zone through water-cooled balanced valves easily regulated from the ground, where are located the temperature gauges for each kiln.

The continuous discharge mechanism at each kiln is driven from a common shaft but can be stopped or started independently of the balance of the kilns in the battery. The speed of discharge is figured to 25 tons of lime per day of 24 hours; though means are provided for varying the speed of the common driving shaft.

The top of the kiln is closed and in the cover is located a hopper and charging bell, the latter raised and lowered by compressed air and designed to give a uniform distribution of the stone over the top of the kiln, maintaining the surface level at all times, insuring an even



Gas producer and main

distribution of the gases in the preheating zone. At the top of the kiln is also located the draft pipe for the exit gas, regulated by a valve of the same type as that used for the fuel gas.

The total height of the kiln to the level of the charging floor is 60 ft., and from the bottom of the cooling zone to the top of the preheating zone 48 ft. The diameter maximum is 8 ft. inside the brick work. The stone is charged in uniform batches of 1,000 lbs. and at regular intervals of 15 minutes, or four periods per hour, for a capacity of 25 tons per day. The draw is continuous and can be arranged at any section of the bottom circumference, where most convenient. The cold lime being removed in wheel barrows direct to cars for shipment.

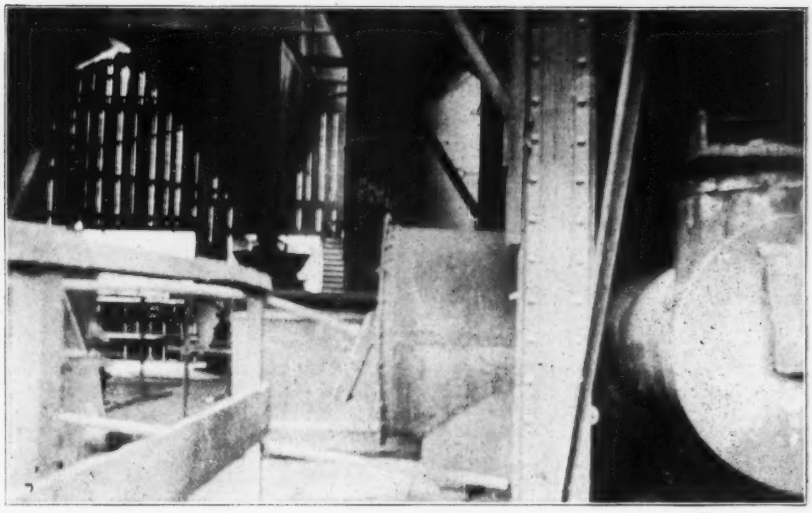
Wide Market

At the old plant are two cooperage shops which make all the barrels required. The company has experimented with hydrated lime, but has never installed a hydrating plant.

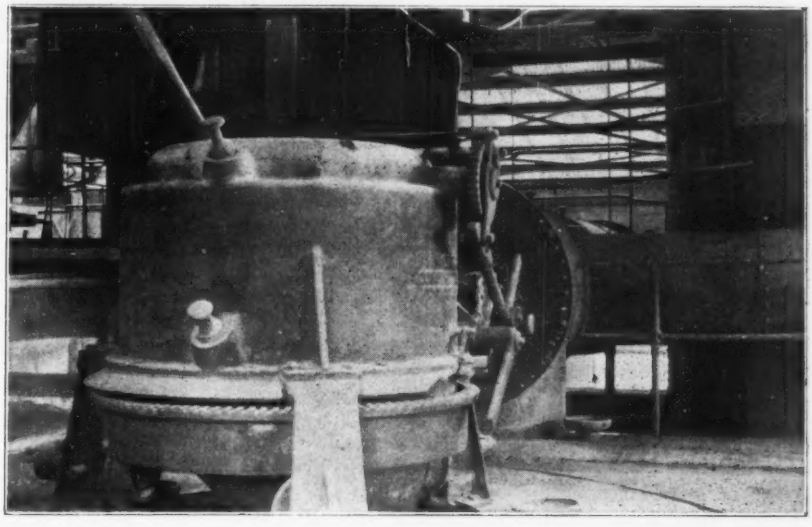
The lime made at this plant is one of the purest high calcium limes made and is marketed from Michigan to New Jersey. Very large quantities of it have been used by the United States Government in construction work at West Point, Annapolis, Washington, D. C., and at Panama.

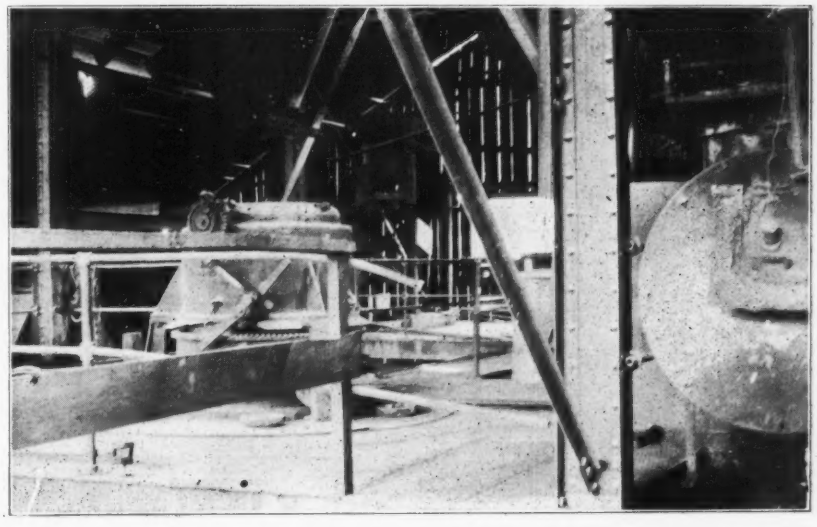
Officers

The president of the Farnam-Cheshire Lime Co. is C. J. Curtain, of New York City, and the treasurer and manager is



Firing floor of gas producer





Various views of the two gas producers and their arrangement and piping details

his brother, Thomas J. Curtain, of Pittsfield.

French Potash Situation

(Trade Commissioner J. F. Butler, Paris, Jan. 21, 1920.)

WITH THE EXCEPTION of the Societe de Kali Sainte Therese, under Alsatian-French control, all of the potash mines in Alsace were owned and operated by German companies before the war. The first company to extract potash in Alsace was formed in 1906. At the time of the armistice there were 14 companies, controlling 109 concessions and 17 mines, these companies being in turn controlled by four large groups. The Sainte Therese group controls 33 concessions, the Deutsche Kaliwerke group controlled 48 concessions, the Wintershall group, 13 concessions, and the Hohenzollern group, 15 concessions. The German holdings, under liquidation since the armistice, are being operated for the account of the French Government.

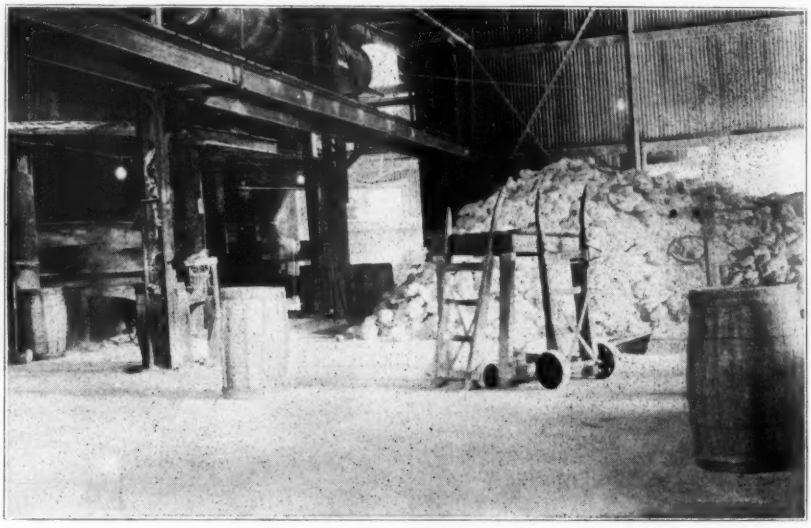
The estimated production of crude potash from the Alsatian mines during 1920 is 1,320,000 tons, or about 220,000 tons of pure potash. It is expected that this output will increase to 2,040,000 tons of crude or 340,000 tons of pure potash in 1921, and to 2,340,000 tons of crude or 390,000 tons of pure potash in 1922.

Of the production in 1919 American purchasers were able to obtain only 100,000 tons because of the inadequate transportation service, but much larger shipments to America are expected this year.

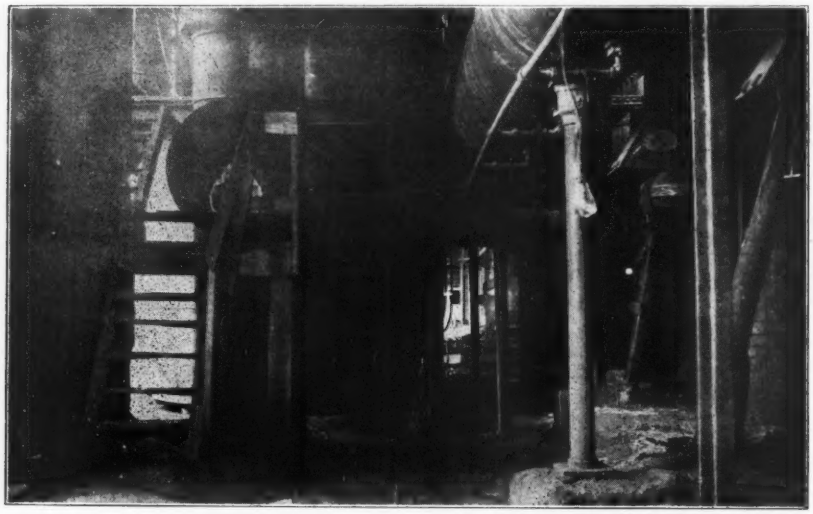
Prospects for Franco-German Potash Combine

There have been rumors of a possible understanding between the German and the French potash interests respecting the control of sales and prices.

Continuous drawing mechanism of Mount kilns



Drawing floor of Mount kilns



Gas producer on battery of three old kilns

Rockland & Rockport Lime Corp. to Rebuild Hydrating Plant at Once

ON FEBRUARY 20 the old hydrating plant of the Rockland & Rockport Lime Corporation at Rockland, Maine, was destroyed by fire. The loss was estimated at $100,000, well covered by insurance. Seven kilns were put out of commission by the fire, but otherwise the company will not be seriously handicapped as it operates other hydrating plants and a total of 60 kilns.

A communication from George B. Wood, president of the corporation, states that "The portion of the plant destroyed was one of our oldest pieces of property, and we plan to erect this year, on the same site, a modern plant of the most up-to-date character."

The Rockland lime industry was one of the first established in America.

Random Comments on the Issues of the Day

Railway Ballast

Practically every large producer of sand, gravel, crushed stone and crushed slag will find interesting reading in the discussion of railway ballast at the recent annual convention of the American Railway Engineering Association reported on another page of this issue in detail.

As labor and financial conditions of the railways ease there is every prospect that the long deferred work of putting the tracks in condition to carry the ever increasing and more concentrated traffic will proceed on a scale never before equaled.

It will be a matter of satisfaction to commercial producers to see that practically all the more important railway systems have now come to regard ballast the same as they do their other material requirements and prefer to purchase it of commercial producers whenever it is possible to do so.

The reasons the railway engineers have come to this decision are partly stated in the report, the principal one being, of course, the obvious one to commercial producers—that a ballast plant cannot be run economically unless an outlet is found for all the material produced, and that to run its own ballast plant economically the railway would have to go into the commercial lines. Another reason which is not mentioned in the report, but which is equally obvious to producers, is that the railways now get their ballast practically at cost of production and undoubtedly will continue to do so.

It is a side issue to argue whether or not they *should* get ballast at cost. The exigencies of the situation nearly always require it. There are many other considerations in such business than a matter of a few hundred or a few thousand dollars profit on ballast, in the case of the average commercial crushed-stone or gravel plant.

If a plant is designed to produce 500,000 tons per annum everyone knows it costs nearly as much to operate it to produce 250,000 tons as it does 500,000 tons. Or, vice versa, if it costs a certain amount to produce 250,000 tons, every operator knows it *does not* cost twice as much to produce 500,000 tons. The extra 250,000 tons may be produced for less than half what the first 250,000 tons cost.

Hence a 500,000-ton commercial plant doing a 250,000-ton commercial business can afford to take a 250,000-ton ballast order for less than the cost of producing the commercial stone alone, and not only be ahead of the game financially, but vastly so from other points of view—particularly in the matter of friendly relations with the railway management and the assurance of a car supply.

Plants operated mainly for the production of ballast are of course in an entirely different class and must earn a profit on this business or go broke. On the other hand, no experienced commercial producer thinks of asking commercial prices for ballast unless he has a virtual monopoly, and generally even in such cases his monopoly is short lived, as almost any railway crosses many deposits of suitable material and nothing is easier than for the railway to start a new producer in the business by the promise of a large ballast order. While the loss of the ballast business may not worry the older established producer, the presence of a new commercial operation in his territory assuredly will, and the contingency is certainly to be avoided when possible.

Those who have had the most success in dealing with the railways for ballast contracts are the men who have laid all the cards on the table, who recognize the railway's unassailable advantages in making the deal, who make the best of the situation, possibly show the railway their cost figures and get actual cost and so much more as they can under the circumstances.

It should go without saying that the producer must know all his costs; and in estimating future costs make liberal allowance for unforeseen contingencies.

Seasonal Prices

It has been called to the attention of Rock Products that the policy outlined by the manager of the Illinois Sand and Gravel Producers Association in the matter of seasonal price quotations related only to the cases of small dealers who ask for quotations on a specific amount of material, which they estimate will amply cover their seasonal demands, and who want an option as to whether they will take any or all of the material as the season progresses.

It is said that this practice induces the producer to make prices based on an expected tonnage, which are considerably less than could be quoted if he knew in advance that the dealer would ultimately take only a third or a half of what he was quoted on; that this practice in the aggregate of many small items leaves the producer holding the bag at the end of the season, while the dealer gets off with a price he is not entitled to.

Undoubtedly all this is true and many producers have reason to regret their experience in similar cases during the last two years when costs of all kinds have risen beyond expectation. Nevertheless, the case cited in Rock Products of February 28, p. 40, is a notable example of where the producer publicly assumes this very gamble and throws the full weight of his influence to stabilize the market. Possibly very few individuals can afford to do this, but it might be considered as a trade association policy.

Go After Your Gear Accidents

(Reprinted from the Accident Prevention Bulletin of the Portland Cement Association for March and April.)

TO THE QUESTION "Which gears should be guarded?" there is only one answer—all gears, regardless of size or location. The accident files of the association contain so many records of accidents due to unguarded gears that there can be no doubt about this statement. These accidents, the records show, may be caused by any one of several factors. A man may trip on some object on the floor and thereby be caught in an unguarded gear; if he wears loose clothing this may come in contact with a gear. These things are contributing factors, but the main reason for the accident is that the gear was unguarded, without which no accident could have taken place.

To illustrate how gear accidents occur a few cases are quoted from recent reports:

1. Was lifting lump of clinker out of chute; foot slipped and clothing caught in miter gear. Left arm totally disabled.

2. Oiling elevator gear; glove caught and hand was severely injured.

3. Oiling gears on dryer; coat sleeve caught in gear. Arm fractured.

4. Oiling elevator gears; guard had been removed. Arm caught and amputated.

5. Oiling conveyor gears; guards removed for repair. Arm caught and amputated.

6. Oiling miter gear; hand caught. Five fingers amputated.

7. Oiling tube mill gears, using a corn broom. Hand caught and all fingers except thumb amputated.

8. Cleaning motors, looked around for his companion. Hand caught in gear. Right arm amputated.

9. Scraping grease from floor. Scraper handle caught in tube mill gears, drawing hand into gears. Left arm amputated.

10. Oiling kiln gears. Finger caught and severely bruised.

11. Slipped and was caught in gear. Two fingers amputated.

12. Filling grease cup on pump. Finger caught in gear and severely lacerated.

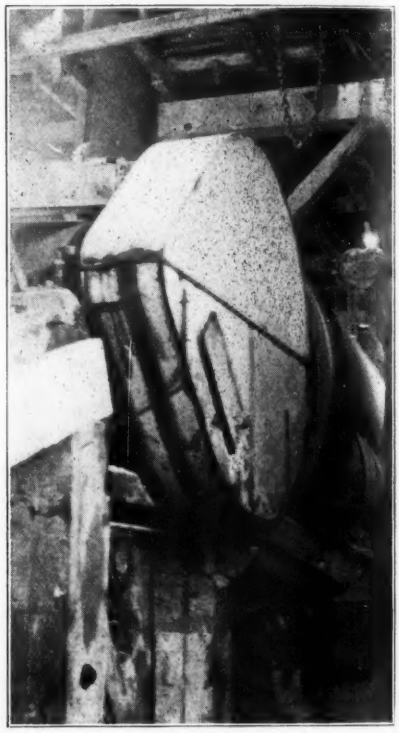
13. Overcoat caught in gears while tightening grease cups. He put out hand to steady himself and it was caught in other gears. At that moment someone shut down machinery or man would have been killed. Little finger amputated and body severely bruised.

14. Oiling kiln gears. Glove caught. Left thumb amputated.

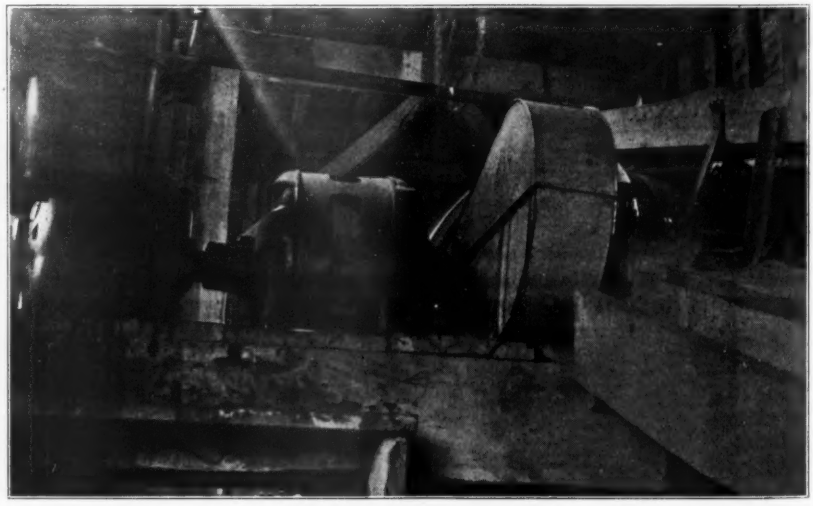
The above gear accidents happened during a period of about six months at thirteen different cement plants.

Six of the above reports do not state whether the gears involved had been guarded; two state that guards were not installed; two that guards had been removed, and four that guarding was insufficient.

Nine of the accidents happened to oilers. In the early days of accident prevention when it came to the question of guarding gears somewhat removed from the beaten paths in industrial plants, the statement that "nobody ever gets near those gears except the oiler" would frequently be given as an excuse for not guarding them. The oiler is, by reason of his work, in greater danger of being caught in gears than anyone else and he is entitled to such conditions that he can work with a fair degree of safety, no matter where his duties take him. "Follow the Oiler" is a slogan well known among safety men.



Properly guarded screen-drive gear at the gravel plant of the Blue Limestone Co., Minneapolis



Motor drive and gears at top of belt conveyor.—Motor at extreme left is not operated

Commercial Explosives—II

Prepared by the Engineering Department of the National Safety Council

NO artificial heat of any kind, for thawing or other purposes, should be introduced into a magazine. Thawing should never be conducted in the magazine, but should be done in a separate building at a safe distance from the magazine.

Lightning rods may afford valuable protection. If a system of lightning protection is installed it should have competent and regular inspections and tests.

In selecting a magazine site, advantage should be taken of any natural protection offered by hills. Sandy soil is to be preferred to rocky ground, for in case of accidental explosion the former will reduce the distance at which damage will be done.

Where an accidental explosion would endanger life or near-by property it is often desirable to erect barricades on the sides where damage may be done. Barricades are constructed of earth or sand from which all large stones or other projectile material has been removed. The mounds are usually 3 ft. higher than the highest point of the magazine. They are 3 ft. wide at the top, with a natural slope on both sides, the inner slope reaching to within a few feet of the sides of the magazine.

In nearly all foreign countries laws have been passed determining the permissible distances of magazines from inhabited dwellings, railroads (exclusive of industrial railroads owned and controlled by the magazine owner), public highways and other magazines. Several of our states have similar laws. The attached table of distance has been suggested by the Bureau of Mines and it is recommended that operators follow this table unless it conflicts with local laws.

The National Board of Fire Underwriters recommends the following table of distances between magazines:

Pounds of Explosives Stored in Magazine	Feet Distance from Any Other Magazine
50 or more	Detached
5,000 or more	200 feet
25,000 or more	To 200 feet add 2⅔ feet for each 1,000 pounds of explosives in excess of 25,000.

Note: This table applies to magazines which are not barricaded. If there are proper barricades, the distances in this table may be reduced one-half.

In practice the construction of magazines differs materially. Many are built of concrete, bricks or large blocks of stone. There is probably only one objection to these materials; in case of accidental explosion large parts of the magazine itself may be hurled through the air as missiles. More frequently magazines are built of a light framework covered with corrugated iron, no attempt being made to erect a bullet-proof structure.

As a result of experiments the Bureau of Mines has built a cement-mortar magazine which is probably as near perfection as any yet reached. The concrete of the foundation consists of one part cement, three parts sand and five parts gravel. The cement-mortar of the walls is one part cement to six parts coarse sand. The advantage in using these proportions is that an accidental explosion will not break the walls into large fragments. Besides offering maximum protection in other respects the magazine is protected against lightning by having its entire roof and all sides covered with galvanized sheet-iron, all parts of which are grounded with half-in. iron rods. These rods extend from the four lower corners of the building and are attached to properly laid earth plates buried well below the moisture line.

Thawing

Practically all dynamites freeze at temperatures ranging from 35 degrees to 52 degrees F. or less. In order to use such explosives safely and to procure the maximum efficiency, they must be properly thawed before being used. When thawed dynamite feels plastic or like a mass of flour between the fingers. When frozen or partly frozen it feels somewhat rigid and hard. Dynamite should be thawed completely, otherwise it cannot be properly detonated. Improper detonation increases the production of poisonous gas and the possibility of igniting any explosive mixture of coal dust or coal gas which might be present in the air. After and during thawing the nitroglycerine tends to separate from the dope and to run out of the cartridge. For this reason explosives should never be laid on end. No attempt should be made to thaw a frozen explosive by placing it on a shovel, in a tin can, before an open fire, near a boiler, in an oven, on steam pipes, in hot water, over a lighted candle or in the sunlight. During thawing, explosives are extremely sensitive and should be handled with great care.

When thawing small quantities a thawer may be used which consists of a water-jacketed metal vessel closed with a tin cover. The water before being poured into the vessel is heated to a temperature not uncomfortable to the immersed hand. This temperature should never exceed 130 degrees F.

When working on temporary operations the manure thawer may be used to thaw small quantities of explosives. The explosives are simply placed in a tight box which is then surrounded with 12 to 18 in. of fresh manure. Such thawing is cheap but slow in action. The placing of explosives directly in manure piles should be discouraged, for then the cartridges may absorb moisture and, through fermentation, may become as dangerously hot as 150 degrees.

When large quantities of explosives must be thawed a thaw house situated at a safe distance from the magazine and other buildings should be provided. The capacity of the thaw house should be such that it will not hold more than is necessary for one shift. It should never hold more than 500 pounds of explosive. Explosives may lose their strength if repeatedly thawed and frozen. It is not safe to expose an explosive to long, continuous heating, as some explosives are liable to decompose and explode when subjected to high temperatures for but a few days. Only in several metal mines in extremely cold climates has it been found necessary to erect thaw houses within the mine. Then they are generally placed in an abandoned or worked-out place in the mine in one of the upper levels.

(To Be Continued)

And Jones Is Only One of Thousands Killed Each Year in Accidents

SAVING JONES and all of the thousands—saving you the dollars which each accident costs—is the mission of the National Safety Council.

What the National Safety Council Is

Thirty-eight hundred industrial concerns co-operating to prevent accidents.

What It Does

It helps you to prevent accidents. It saves money for you. It offers the only service in existence that is comprehensive enough to meet present-day conditions and produce results.

It offers—to you, individually, and to Industry, as a whole—the opportunity to reduce all accidents 75%. It is strictly non-commercial and non-profit-making.

Write the Business Division for Details

National Safety Council

Co-operative—Non-commercial

168 N. Michigan Avenue, Chicago

Union Labor Squabbles Chief Disturbing Element

Added to Acute Car Shortage Makes Stabilization of Building Costs Impossible

PROTRACTED bickering for power among certain artisans in the building trades has upset the spring program considerably in the building material trades to the extent of advancing quotations in some lines with more probably to follow, says the Dow Service Daily Building reports.

Building material manufacturers expected long before this to be able to gauge their 1920 production schedule by prospective demand. Potential demand has been easily measured, but the actual requirement is so much in doubt at this time that few firms have proceeded on the basis laid out a month ago. In the case of one architect alone, of $500,000 worth of cement work which was scheduled for January and February, only $20,000 worth has actually gone ahead. This is a fair proportion of almost all of the work scheduled for progress in the first quarter of this year.

In the structural steel industry, to cite another example, while builders have been awaiting an adjustment of labor differences, the country's structural shops have contracted for 95 per cent of their capacity, according to the February report of the Bridge Builders and Structural Society, as collected by their secretary, George F. Gifford.

Prices Still Advancing

Simultaneously, many building material mills in various lines are abandoning their program for building material production for 1920 and are advancing prices for the stocks that still remain on hand. With labor union factors warring one with the other, the presidential election at hand, and freight cars so scarce that additional plants are closing down because they cannot ship what they produce, all efforts to stabilize building material prices have been abandoned, and the price situation appears to have been thrown wide open. Price advances last week involved terra cotta hollow tile fire proofing material, finishing lime, common lime and hydrate finishing lime. Window and plate glass discounts are without change in actual price, although all quotations are nominal and depend almost entirely upon what the vendor has to offer. Common brick remains at $25 a thousand wholesale, with the usual charges for hauling, handling, and 15 per cent for delivery. Sheet metal is extremely scarce and hard to obtain. Nails are being sold on the ration plan like sugar in war days.

Freight car shortage is almost entirely responsible for famine conditions in the present building material market for wood lath, Oklahoma plaster, plaster boards, Ohio lime and most of the departments in the lumber market. There were only five barge loads of brick at the docks on Saturday morning. The famine in building sand was partially broken last week when eight scow loads of sand were brought from Cow Bay, but the demand was so overwhelming that the meagre supply was quickly absorbed.

Lime Advances

In the lime department prices which were dependable for the spring market two weeks ago are now quoted about 30 cents above the former on finishing and common lime, and about $1.25 on hydrate finishing lime, in cloth and paper bags. The cause for this advance in price is ascribed mainly to high cost of cooperage which is due to car shortage which has prevented the barrel companies from obtaining raw materials for heads and staves. In the Buffalo territory one gypsum company has actually been forced to close its plant because they have been unable to get cars, although their store rooms are filled with material wanted in New York.

In the West price advances on cement occurred amounting to 10 and 20 cents a barrel. In some cases manufacturers are unable to accept business very far into the future on account of heavy orders for road repairs and equipment this spring. In this respect the cement interests and the steel interests are similar. There is a common feeling in the building material market that the demand for steel and cement outside of the building industry has developed so greatly, especially with reference to railroads' requirements this year, as to make some of the firms indifferent as to whether the building market develops or not.

Complaint is being made by general contractors regarding the heavy cost of making estimates for jobs that do not proceed. This accounts in a large measure for the indifferences of many contractors to figure building operations. There is a movement on foot to request the architects to call in a practical builder for guidance as to present cost of material and shipping conditions before requesting general estimates on new work.

The principal hope for averting a runaway building material price market this spring rests upon early peace in the warring labor unions, so that building material manufacturers may know what the 1920 building material requirements may be before it is too late.

Chamber of Commerce of the United States to Discuss Production

SEEING IN INCREASED PRODUCTION a means of restoring normal business and price conditions, the Chamber of Commerce of the United States, it has been announced, will make its eighth annual meeting, to be held at Atlantic City, April 27 to 29, an "Increased Production Convention."

This subject is considered of such importance that in working out a program for the meeting every topic will be considered from this viewpoint. Lack of production, it is pointed out, is one of the chief causes of the high cost of living which cannot be reduced until more goods are put on the market. The present is a seller's and not a buyer's market. Prices have been forced up by competitive bidding. This in turn has made necessary unusual wage increases, with a still further rise in manufacturing and producing costs.

The general subject of increased production has been divided up in the program for the convention into sub-subjects. The first to be taken up will be the government in relation to production. Under this heading will be considered anti-trust legislation and taxation. Business of every kind is keenly interested at this time in the situation with respect to taxation, especially in the subject of excess profits taxes, against which there has been general complaint.

The second general subject to be taken up will be transportation in relation to production. This will include both land and water transportation. One of the chief causes of lack of production just now, it has been pointed out, is the general shortage of railroad equipment. One authority estimates that the country is short at least 200,000 box cars and all lines of industry have felt the shortage.

Another important general subject will be the relation of labor to production. This will be approached from both sides, the employe's viewpoint being presented by a representative of the American Federation of Labor and the employer's by a business man.

Besides the general sessions there will be held group meetings, divided as along the great divisions of industry. In these meetings the subject of increased production, as in the general meetings, will be the main topic discussed.

NEW MACHINERY AND EQUIPMENT

New Convertible Shovel

THE BUCYRUS CO., South Milwaukee, Wis., has recently announced a new revolving shovel known as the 30-B, which supersedes their 18-B ⅞-yd. revolving shovel.

The 30-B is in fact a universal machine, inasmuch as it may be used as a revolving shovel, or with the addition of a few extra parts, as a dragline excavator, a clamshell excavator, a locomotive crane, a sewer shovel, or with a long boom and dipper sticks for work requiring unusually high lifts. It is so designed that these changes may be made with the minimum of labor, delay and expense.

As a Revolving Shovel

As a revolving shovel it carries a 1-yd. dipper struck measure. Its truck frame is so designed that it will accommodate caterpillar traction, traction wheels or railroad trucks of any gauge from 3 ft. 3 in. to 5 ft. These three mountings are interchangeable. The working weight of the 30-B shovel on caterpillars is about 34 tons, on traction wheels, 31 tons, and on railroad trucks, 29½ tons.

As a Clamshell Excavator

This new shovel will carry a 1-yd. clamshell bucket with a 35-ft. boom or a ¾-yd. clamshell bucket with a 40-ft. boom. All the change required in this installation is an additional drum on the main hoist shaft with the necessary brake, clutch, thrust cylinder and operating levers, additional ropes, boom, bucket, tag line and trolley. The changes are simply and readily made.

As a Crane

As a crane the 30-B has a capacity of 9¾ tons at 20 ft., when mounted on caterpillars and 9 tons at the same radius when mounted on trucks or traction wheels. To make this change, the same parts are required as for the clam-shell machine, with the addition of the hook.

As a Dragline Excavator

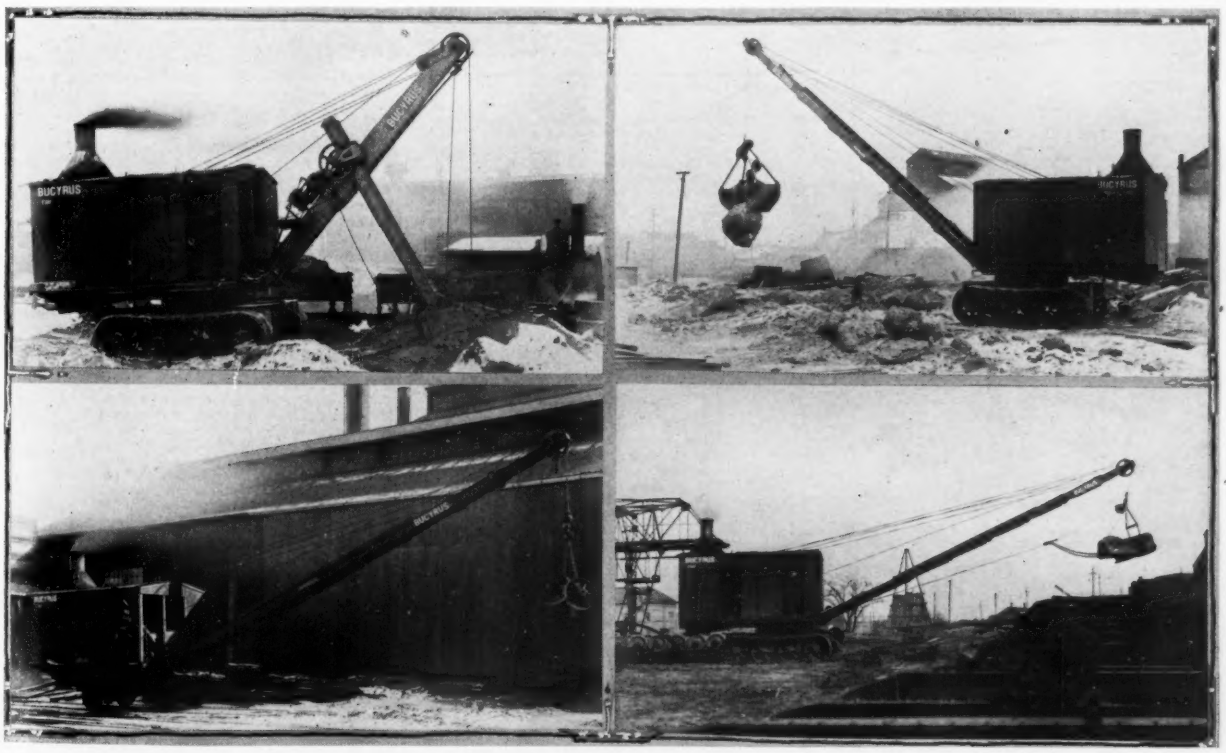
To make this conversion, the same changes are required, with the exception that the tag-line and trolley is not necessary and a fairlead, drag-bucket and rope must be ordered. The 30-B dragline supersedes the Class 7 Bucyrus dragline excavator. It carries a 1-yd. bucket on a 35-ft. boom, or as optional a ¾-yd. bucket on a 40-ft. boom. The caterpillar mounting is recommended, but other types may be used, if conditions require.

For High Lifts

It often happens that a user desires an exceptionally high lift and reach as his work may require loading from deep excavation or for special work of some character. To fulfill this demand, a 26-ft. boom and 17-ft. handle may be purchased.

New Features

The design of this shovel contains a large number of new and improved features, based on many years of experience with all types of excavating machinery, in every description of work. These features embody an extremely rigid construction throughout, an improved steam plant, engines and machinery firmly anchored and so arranged that they may be easily taken care of, a simplified operating lever arrangement, and careful attention to details such as convenience and ease of operation, accessibility and a great reduction in the number of working parts.



New Bucyrus 30-B steam shovel and its various adaptations and conversions

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton. F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.			From stock, 1.50 per net ton, all sizes			
Burlington, Vt.	1.00	.....	2.50	2.00	2.00	.....
Chaumont, N. Y.	.....	1.75	1.65	1.35	1.25	1.25
Coldwater, N. Y.			Flux, 1.50@2.10			
Limekiln, Md.	1.25	2.10	2.00	1.75	1.40	1.25
North Leroy and Akron, N. Y.	1.00	1.00	1.00	1.00	1.00	1.00‖
Utica, N. Y.	1.00		All other sizes 1.50			
CENTRAL:						
Alden, Ia.	.70	.70	1.35	1.35	1.35	1.35
Alton, Ill.	2.00	2.50	1.50	1.50	1.50	.....
Bettendorf, Ia.			1.50 per cu. yd., all sizes			
Buffalo, Ia.	.....	.....	1.60	1.50	1.50	.....
Chicago, Ill.	1.25	2.00	1.65	1.50	1.50	1.50
Cincinnati, Ohio	.....	2.00	2.00	2.00	.....	.....
Cleveland, Ohio	.....	2.40	2.20	2.20	.....	.....
Davenport, Ia.	1.50*	1.50*	1.50*	1.50*	.....	.....
Detroit, Mich.	.....	2.40	1.70	1.60	.....	.....
Dundas, Ont.	.75	1.35	1.35	1.35	1.25	1.10
Eden and Knowles, Wis.	1.00@1.10	1.10@1.20	1.10@1.20	1.10@1.20	1.10@1.20	.....
Elmhurst, Ill.	1.00@1.25	1.00@1.25	1.00@1.25	1.00@1.25	1.00@1.25	1.00@1.25
Ft. Wayne, Ind.	1.60	1.90	1.90	1.80	1.60	1.60
Greencastle, Ind.	1.50	1.25	1.10	1.00	1.00	1.00
Hull, Canada	2.50	2.30	2.50	2.10	2.00	1.75
Illinois, Southern	2.00	1.50	1.50	1.50	1.50	.....
Krause, or Columbia, Ill.	1.80	1.30	1.50	1.40	1.30	1.30
Laumon, Wis.	1.25	1.25	1.25	1.25	1.25	1.25
Lima, Ohio	1.40	1.40	1.40	1.40	1.40	1.40
Mansfield, Ohio	1.70	2.20	2.00	1.90	1.70	1.70
Oshkosh, Wis.			1.40 per ton, all sizes			
River Rouge, Mich.	.....	1.50	1.50	1.50	1.50	1.50
St. Louis, Mo.	.60	1.60	.....	.....	.....	.....
Silica, Ohio	1.00	1.50	1.30	1.20	1.00	1.00
Stone City, Ia.	.80	.....	1.60	1.50	1.40	.....
Toledo, Ohio, f. o. b. cars	1.60	2.10	1.90	1.80	1.60	1.60
Toronto, Canada	1.55	2.25	2.25	2.25	2.05	2.00
SOUTHERN:			These prices include 90c freight			
Brooksville, Fla.	1.00	.....	.....	2.25	2.25	.....
Cartersville, Ga.	.....	2.25	2.10	2.00	.....	1.90
Chickamauga, Tenn.	1.50	1.75	1.75	1.75	1.75	1.75
El Paso, Tex.	1.00	1.00	1.00	1.00	1.00	1.00
Mascot, Tenn.	.....	1.50	1.50@1.75	1.50@1.75	1.50@1.75	.....
Memphis Jct., Ky.			1.10@1.35, all sizes			
New Braunfels, Tex.	.60	1.75	1.65	1.50	1.50	1.50
Winnfield, La.	.80	2.50	.....	2.00	2.00	.....
WESTERN:						
Atchison, Kans.	.50	2.00	2.00	2.00	1.90	1.90
Blue Springs and Wymore, Neb.	.20	1.75	1.75	1.65	1.55	1.50
Kansas City, Mo.	.60	2.00	.....	.....	.....	.....
Mankato, Minn.	.....	.....	.....	1.75	1.50	.....

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md.	.....	.90	2.75	2.50	2.00	1.75
Bernardsville, N. J.	.....	2.80	2.60	2.20	.....	.....
Branford, Conn.	.80	1.50	1.50	1.20	1.10	.....
Birdsboro, Pa.	1.40	1.90	1.80	1.60	1.40	1.40
Castro Pt., Richmond, Cal.	.50*	.....	1.50*	1 50*	1.40*	.....
Dresser Jct., Wis.	.75	2.25	2.25	2.00	1.70	.....
Duluth, Minn.	.75	1.75	1.50	1.25	1.25	.....
E. Summit, N. J.			(2.75@2.85, all sizes)			
Glen Mills, Pa.	1.00	1.35	1.70	1.55	1.35	1.35‖
Meriden, Conn.	.80	1.75	1.75	1.50	1.40	.....
Millington, N. J.	1.80	1.80	1.80	1.60	1.00	.....
New Britain, Conn.	.80	1.30	1.25	1.20	1.00	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Dundas, Ont.—Flint	1.10	1.10	1.10	1.10	1.10	1.10
Little Falls, N. Y.—Syenite	.80	1.20	1.40	1.20	1.20	1.20‖
Mayville, Wis.	.90@1.00	1.10@1.25	1.10@1.25	1.10@1.25	1.10@1.25	1.10@1.25
Middlebrook, Mo.—Granite	3.50	.....	1.75	1.75	.....	1.00‡
Portland, Maine—Granite	1.50	.....	.....	1.35	1.25	.....
Roseburg, Ore.	.....	1.50	1.25	1.05	1.00	1.00
Stockbridge, Ga.—Granite	.50	2.00	1.90	1.75	1.75	.....
White Haven, Pa.—Sandstone	.85	1.20	1.40	1.20	1.20	1.20‖
Granite	1.25	.....	1.50	1.50	1.50	.....

*Cubic yard. †Agrl. lime. ‖R. R. ballast. §Flux. ‡Rip-rap. a 3-inch and less.

Agricultural Limestone

EASTERN:

Coldwater, N. Y.—Analysis, 56.77% $CaCo_3$, 41.74% $MgCo_3$—80% thru 100 mesh; bags, 4.50; bulk..... 3.50

Chaumont, N. Y.—Analysis: $CaCo_3$, 92 to 98%; $MgCo_3$, 1.51%—(Thru 100 mesh); sacks, 4.00; bulk..... 2.50

Grove City, Pa.—Analysis: $CaCo_3$, 94.75%; $MgCo_3$, 1.20%—(70% thru 100 mesh); 80 lb. ppr., 4.60; bulk..... 3.25

Grove, Md.—90% thru 4 mesh; bulk..... 3.00

Hillsville, Pa.—Analysis, $CaCo_3$, 96% (90% thru 100 mesh); sacks, 4.50; bulk 2.75

Jamesville, N. Y.—68% thru 100 mesh; 95% thru 50; 100% thru 20. Sacks, 3.75; bulk 2.25

Syracuse, N. Y.—Analysis, 90% carbonates (50% thru 100 mesh, 90% thru 50 mesh); sacks, 3.50; bulk..... 1.75

Walford, Pa.—(70% thru 100 mesh; 85% thru 50; 50% thru 50; 100% thru 4); sacked, 4.25; bulk..... 2.75

West Stockbridge, Mass.—Analysis: Combined carbonate, 95%—33% thru 200 mesh; 66% thru 100; 100% thru 40. Bulk 2.85

Williamsport, Pa.—Analysis, $CaCo_3$, 88-90%; $MgCo_3$, 3-4%—(50% thru 50 mesh); sacks, 4.50; bulk..... 3.00

CENTRAL:

Alden, Iowa—Analysis, CO_3, 99.16%; bulk ..... .80

Alton, Ill.—Analysis: $CaCo_3$, 96%; $MgCo_3$, 0.75%—50% thru 4 mesh..... 2.50

Bedford, Ind.—(90% thru 10 mesh) Analysis, $CaCo_3$, 98.5%; $MgCo_3$, 0.5% 1.75

Belleville, Ont.—Analysis, $CaCo_3$, 90.9%; $MgCo_3$, 1.15% (45 to 50% thru 100 mesh; 61 to 70% thru 50 mesh); bulk 2.50

Chicago, Ill.—Analysis, $CaCo_3$, 53.63%; $MgCo_3$, 37.51%—90% thru 50 mesh 1.00

Columbia, Ill., near East St. Louis (½" down) ..... 1.25@1.80

Ellettsville, Ind.—Analysis, Carbonate, 98% 2.00

Elmhurst, Ill. — (Analysis, $CaCo_3$, 35.73%; $MgCo_3$, 20.69%) 50% thru 50 mesh 1.25

Greencastle, Ind.—(Analysis, $CaCo_3$, 98%) 50% thru 50 mesh..... 1.75

Howenstein, O.—100% thru 10 mesh; 59% thru 50; 39% thru 100..... 2.75@3.00

Kansas City—(50% thru 50 mesh)..... 2.00

Lannon, Wis.—(90% thru 50 mesh) Analysis, 54%, $CaCo_3$; 44%, $MgCo_3$ 2.00

Marblehead, O. — (Analysis: $CaCo_3$, 95.33%) 100% thru 100 mesh, sacks, 4.75; bulk 2.75

McCook, Ill.—Analysis, $CaCo_3$, 54.10%; $MgCo_3$, 45.04% — 100% thru ¼" sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 26.04% thru No. 50; 16.27% thru 100 ..... .90@1.00

Milltown, Ind.—Analysis, $CaCo_3$, 94%; $MgCo_3$, 3%—(100% thru 4 mesh).... 1.50

Montrose, Ia.—(90% thru 100 mesh).. 1.25

Muskegon, Mich.—(90% thru 50 mesh) Analysis, $CaCo_3$, 53.35%; $MgCo_3$, 43.27% 2.50

Piqua, O.—Analysis: $CaCo_3$, 82.8%; $MgCo_3$, 8.2%; neutralizing power in terms of calcium carbonate, 95.3%—70% thru 100 mesh; bulk..... 2.75@4.50

Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ⅛" mesh) Analysis, $CaCo_3$, 89.61 to 89.91%; $MgCo_3$, 3.82% 2.00

St. Paul, Ind.—Analysis, $CaCo_3$, 85%; $MgCo_3$, 12% 1.50

Stone City, Ia.—Analysis, $CaCo_3$, 98% (50% thru 100 mesh)..... .80

Toledo, O.—Analysis, $CaCo_3$, 52.72%; $MgCo_3$, 43%—(20% thru 100 mesh); 30% thru 50; 80% thru 100; 100% thru 5/32 screen)..... 1.80

Whitehill, Ill. — Analysis, $CaCo_3$, 96.12%; $MgCo_3$, 2.50%— 90% thru 50 mesh, bulk..... 2.00
90% thru 100 mesh..... 5.00

(Continued on next page.)

Agricultural Limestone

(Continued from preceding page.)

SOUTHERN:

Cartersville, Ga.—Analysis: 96 to 98% combined carbonates — All thru 10 mesh with all dust in 2.50

Claremont, Va. (Marlime) — Analysis, 90.94% $CaCo_3$, 0.31% P., 1.36% Mg., 0.37% K.; bulk 4.50
100 lb. ppr. bags 6.00
100 lb. cloth bags 6.50

Dittlinger, Tex. — Analysis, $CaCo_3$, 99.09%; $MgCo_3$, .04%.
90% thru 100 mesh 2.00
90% thru 4 mesh 1.00

Grovania, Ga.—Analysis, $CaCo_3$, 95%; $MgCo_3$, none—50% thru 100 mesh 2.50

Hopkinsville, Ky.—Analysis, 94.6 to 98.1% $CaCo_3$—Bulk 2.00

Linnville Falls, N. C. — Analysis, $CaCo_3$, 54%; $MgCo_3$, 42%—50% thru 100 mesh; sacks, 4.00; bulk 2.50

Marion, Ga.—Analysis, 90% $CaCo_3$—(50% thru 100 mesh) 2.00

Memphis Jct., Ky.—(Analysis, $CaCo_3$, 95.31%; $MgCo_3$, 1.12%); average price, ½ in. down 2.00

Mascot, Tenn.—Analysis, $CaCo_3$, 52%; $MgCo_3$, 38%.
(80% thru 100 mesh) 2.75
(All thru 10 mesh) 2.25
(80% thru 200 mesh) 4.00
Paper bags, $1.50 extra per ton; burlap, 2.00 extra per ton.

Maxwell, Va. 2.50

Mountville, Va.—Analysis, $CaCo_3$, 76.6%; $MgCo_3$, 22.8%—100% thru 20 mesh; sacks, 5.50; bulk 4.50

Ocala, Fla. — Analysis, $CaCo_3$, 98%—(75% thru 200 mesh) 4.50

Tyrone, Ky.—Analysis, $CaCo_3$, 93%; $MgCo_3$, 6%—90% thru 4 mesh 2.25

Winnfield, La.—(50% thru 50 mesh) 3.00

WESTERN:

Cement, Calif.—50% thru 50 mesh 4.00

Colton, Calif.—Analysis: $CaCo_3$, 95%; $MgCo_3$, 1½%; bulk, 2.50; bags ..... Sacks, 15c extra, returnable. 2.50

Kansas City, Mo., Corrigan Sid'g—50% thru 50 mesh; bulk 1.35

Terminous, Calif.—Analysis, 94% $CaCo_3$, 1.4% $MgCo_3$—(60% thru 200 mesh; 90% thru 100 mesh; 100% thru 40 mesh); sacks, 4.50; bulk 4.00

Miscellaneous Sands

Silica sand is quoted washed, dried and screened, unless otherwise stated.

GLASS SAND:

Berkeley Springs, W. Va. ..... 2.25@2.75
Special hand selected rock 2.50
Bridgeton, N. J. 2.00
Cedarville and South Vineland, N. J.—
Glass, damp 2.00
Glass, dry 2.50
Gray Summit, Mo. ..... 2.00@2.50
Guion, Ark.—Carlots 2.00
Hancock, Md.—Damp 2.00
Klondike and Pacific, Mo.:
Contracts 2.00
Carlots 3.00
Mapleton, Pa. 2.50
Glass, damp 2.00
Massillon, Ohio 3.00
Michigan City, Ind. ..... .50
Millington, Ill.—Contracts 2.00
Mineral Ridge, O. 3.00
Montoursville, Pa.—Green, washed 1.50
Oregon, Ill.—Large contracts 1.75
Open market 2.50
Ottawa, Ill. ..... 1.75@2.50
Robinson, Md., washed, screened, not dried 2.00
St. Marys, Pa.—Green 2.50
Sands, Elk Co., Pa.—Selected, green 2.75
Thayers, W. Va.—Washed 2.75
Unwashed 2.50
Utica, Ill. ..... 1.75@2.50

FOUNDRY SAND:

Albany, N. Y.—Core 1.50
Furnace lining ..... 2.25@2.50
Molding coarse, fine 2.50
Brass molding 2.50
Sand blast ..... 2.50@3.75
Allentown, Pa.—Core ..... 1.50@1.75
Molding coarse 1.50
Arenzville, Ill.—Molding fine ..... 1.50@1.75
Beach City, Ohio—Core 2.50
Green silica sand (not dried) 2.25
Washed silica sand (not dried) 2.50
Sand blast ..... 2.75@3.50
Bowmantown, Pa.—Core 1.25
Plastering sand 1.30
Molding, fine and coarse 1.50

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Ambridge, South Heights, Pa.	.....	1.30	.....	1.30	1.00	1.00
Attica, N. Y.	.65	.65	.65	.75	.75	.75
Concord Jct., Mass.	1.00	1.00	1.25	1.25	1.25	1.25
Farmingdale, N. J.	.68	.48	1.50	1.35	1.35	1.30
Hartford, Conn.	.90	.....	1.25	1.15	1.15	1.15
Ludlow, Mass.	.....	.75	.....	.....	1.10	1.00
Morristown, N. J.	.60	.60	1.75	.....	1.40	1.35
Portland, Me.	1.00	.50@ .60	.....	1.35	1.25	.....
Washington, D. C. (F. O. B. wharves on cars)	.75	.75	2.00	1.40	1.20	1.20
Yardsville, N. J.			.50@ .75, all sizes			
CENTRAL:						
Alton, Ill.	.60@ .75	.60@ .75	1.50@4.50	1.30	1.20	1.20
Anson, Wis.	.....	.60@ .75	.....	1.25@1.50	.....	.90@1.25
Attica, Covington, Silverwood, Ind.	.85	.85	.85	.85	.85	.85
Barton, Wis.	.85	.70	1.00	.80	.80	.80
Beloit, Wis.			.60 sand, 1.00 gravel			
Chicago, Ill.	.....	1.30@1.40	1.30@1.50	.....	.....	.....
Columbus, Ohio	.....	.70@1.00	.70@1.00	1.00	.70@1.00	.70@1.00
Covington, Ind.	.75	.75	.85	.75	.75	.75
Des Moines, Ia.	.75@1.00	.75	1.65	1.65	1.50	1.50
Earlestead (near Flint), Mich.	.60	.60	.....	.....	.....	.70
Eau Claire, Wis.	.70	.70	2.25	.....	1.35	.....
Elgin, Ill.	.....	.80	1.00	.80	.80	.80
Ft. Dodge, Ia.	1.35	1.25	2.15	.....	.....	2.05
Ft. Jefferson, Mechanicsb'g, O.	.50@ .60	.50@ .60	.50@ .60	.60@ .70	.60@ .70	.60@ .70
Grand Rapids, Mich.	.50	.60	1.00	.90	.80	.80
Grass, Mich.	.....	1.00	1.60	1.20	1.20	1.20
Indianapolis, Ind.	.60	.60	.....	1.50	.75	.75
Mason City, Ia.	.85	.75	1.65	1.60	1.50	1.40
Milwaukee, Wis.	1.25	1.25	1.35	1.35	1.35	1.35
Minneapolis, Minn.	.50	.50	1.75	1.75	1.50	1.50
Oxford, Mich.			(60-40 mix, .85 per ton)			
Pittsburgh, Pa.			(Sand, 1.30; gravel, 1.00)			
St. Louis, Mo., F. O. B. cars	2.20@2.25	.....	2.50	2.30	2.30	2.25
Summit Grove, Ind.	.85	.85	.85	.85	.85	.85
Terre Haute, Ind.	.75	.75	.....	.85	.75	.75
Toledo, Ohio	.75	.75	.....	.....	.....	.....
Yorkville, Moronts, Oregon and Ottawa, Ill.	.70	.70	.80	.80	.80	.80
SOUTHERN:						
Alexandria, La.	.....	.80	.....	.....	.....	1.35@1.75
Arkansas City, Ark.	.....	.75	.....	.....	.....	.....
Flomation, Ala.	.....	.85	.....	.....	1.80	.....
Knoxville, Tenn.	1.15	1.15	1.50	1.50	1.50	1.40
Lake Weir, Fla.	.....	.60	.....	.....	.....	.....
Lincoln, Neb.	.90	.90	2.20	2.20	.....	.....
Macon, Ga.	.....	.75	.....	.....	.....	.....
Memphis, Tenn.		(Sand, 1.25 per cu. yd.; gravel, 1.50 per cu. yd.)				
N. Martinsville, W. Va.	.....	1.10@1.20	.....	.....	.....	.90@1.00
Pelzer, S. C.	.80	.80	.....	.....	.....	.....
Pine Bluff, Ark.	1.20	1.20		1.30 all other sizes		
Roseland, La.	.....	.35	.....	.....	1.25	.....
Thomas, La.	.60	.....	.....	.....	.....	1.75
Tulsa, Okla.	.....	.70	.....	.....	.....	.....
Valde Rouge, La.	.....	.80	.....	.....	.....	1.25@1.50
Waco, Texas	.70@ .80	.70@ .80	.....	.....	.....	1.10
WESTERN:						
Essex, Humboldt Co., Calif.	.....	1.35	1.35	1.35	1.35	1.35
Grand Rapids, Wyo.	.50	.50	.85	.85	.80	.80
Kansas City, Mo.		(Kaw River sand, car lots, .75 per ton, Missouri River, 1.50)				
Niles, Calif.	.80@1.00	.70@ .85	.75@1.00	.70@1.00	.70@1.00	.70@1.00
Pueblo Col.	.95*	.75*	.....	1.50*	.....	2.00*
Saratoga, San Jose, Calif.	.....	.60@ .75	.60@ .70	.60@ .70	.60@ .70	.60@ .70
Seattle, Wash.	1.25	1.25	2.00	1.25	1.25	1.25
Vancouver, B. C.	.....	1.30*	.....	1.30*	.....	1.10*
Yorkville, Ore.	.60	.60@ .75	.70	.60@ .75	.60	.50@ .60

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Boonville, N. Y.	.60@ .85	.60@ .75	.....	.....	.....	.85
Burnside, Conn.	.80*	.....	.....	.....	.....	.....
Fishers, N. Y.	.70@ .80	.75@ .90	.....	.....	.....	.85@ .90
Yardville, N. J.	.....	.50@ .75	.....	.....	.....	.....
York, Pa.	.....	1.10@1.30	(crushed rock sand)			
CENTRAL:						
Earlestead, (near Flint, Mich.)			.60 per yd.			
Grand Rapids, Mich.	.40	.....	.....	.75	.....	.60
Grass, Mich.	.....	.60	1.00	1.00	1.00	1.00
Illinois, Northern	.....	.....	.....	.....	.....	.50@ .60
Janesville, Wis.	.....	.65	.....	.....	.75	.....
Lincoln, Neb.			Sand gravel mix, 1.30			
Oxford, Mich.			Including cobbles, $1.00 per yd.			
Summit Grove, Ind.	.65	.65	.65	.65	.65	.65
SOUTHERN:						
Albany, Ga.	.70@1.00	.....	.....	.....	.....	.....
Dudley, Ky. (Crushed Sand)	.....	.95	.....	1.00	.....	.....
Lindsay, Tex.	1.00	.....	.....	.....	.....	.50@ .75
Thomas, La.	.....	.....	.....	.....	.....	.40@ .70
Valde Rouge, La.	.....	.....	.....	.....	.....	.60@ .75
Waco, Texas	.....	.....	.....	.....	.....	.95
WESTERN:						
Niles, Calif.	.25@ .40	.....	.....	.....	.....	.....
Pueblo, Col.			River Run, .75* unscreened			
Saratoga, San Jose, Calif.	.....	.60@ .75	.60@ .70	.60@ .70	.60@ .70	.60@ .70
Yorkville, Ore.	.....	.40	.....	.....	.40	.....

* Cubic yard. B Bank. L Lake. ‖ Ballast.

Crushed Slag

City or shipping point	Roofing	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:							
Bethlehem and Emaus, Pa.	2.50	.90	1.50	1.00	1.00	1.00	1.00
Buffalo, N. Y.	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Cleveland, Ohio.		.85		1.05	1.05	.95	.95
E. Canaan, Conn.	3.50	1.10	3.00	1.35	1.25	1.25	1.25
Erie, Pa.		1.25	1.25	1.25	1.25	1.25	1.25
Emporium, Pa.		1.25	1.25	1.25	1.25	1.25	1.25
Ensley, Ala.	2.05	1.00	1.25	1.25	1.25	1.00	.95
Hokendaugua and Donaghmore, Pa.	2.50	.90	1.50	1.00	1.00	1.00	1.00
Lebanon, Pa.	2.50	.85	1.50	.85	.85	.85	.85
Philadelphia Dist.	2.50	1.00	1.50	1.00	1.00	1.00	1.00
Pittsburgh, Pa., Dist.	2.05	1.15	1.50	1.15	1.15	1.15	1.15
Sharpsville, Pa.	2.00	1.20	1.60	1.20	1.20	1.20	1.20
CENTRAL:							
Chicago, Ill.	All sizes, $1.50, F. O. B. Chicago						
Detroit, Mich.	All sizes, 1.65, F. O. B. Detroit						
Ensley, Ala.	2.05	1.00	1.10	1.25	1.25	1.00	.95
Ironton and Jackson, O.	2.00	1.25	1.50	1.25	1.25	1.25	1.25
Toledo, O.	All sizes, 2.00, F. O. B. Toledo						
Youngstown, Dover, Hubbard and Leetonia, O.	2 00	1.20	1.60	1.20	1.20	1.20	1.20

Agricultural Lime and Hydrate

	—Agricultural Lime— Bulk	Bags	Per Cent CaO	Per Cent MgO	Agricultural Hydrate Bags
EASTERN:					
Adams, Mass.			98	38	8.00
Apollo, Pa.	3.25		95.14	1.44	
Bellefonte, Pa.	8.00		98.5	.72	11.50
Berkeley, R. I.		14.00	45	15	
Bridgeport, Pa.	7.50@9.00		55	44	9.00@11.00
Cavendish, Vt.	2.50 bbl. in car lots				
Cavetown, Md.	8.50				
Cedar Hollow, Devault, Rambo and Swedeland, Pa.	8.00	10.75 grd.	58	38	10.75
Chippewa, Pa.	6.00		78.67	1.33	
Farnams, Mass.	6.00	7.50	60	2	
Frederick, Md.	7.75		88	5 to 8	10.50
Grove City, Pa.	3.25	4.50	94.75	1.20	10.25
Grove, Md.	8.00				10.75
Highgate Springs, Vt.		8.00	85	2	
Hollidaysburg, Pa.	5.50@7.50		94.68		
Hyndman, Pa.	5.00	8.50	80.23	2.87	
Lime Bluff, Pa.	5.00@6.25		78.67	1.33	
Lime Kiln, Md.	8.00	10.75			10.75
Lime Ridge, Pa.	5.25		80.56-62.56	3.87-1.75	
Newburgh, N. Y.			57	38	8.00
New Castle, Pa.	3.50	4.50	47.6 to 50.4	0.62 to 1.12	
Paxtang, Pa.	5.50@7.00		60	12	
Rosendale, N. Y.	8.00	9.00	92	5	
Sandyville, O.					9.00
Steuben, Pa., Dover Plains, N. Y., York, Pa.		7.00@9.50	70		10.75 to 12.00
Union Bridge, Md.	8.50		73	1	10.75
Williamsport, Pa.	5.50	10.00	65 to 80	2 to 4	10.00
Williams Station, Pa.	7.50		60.6	39.1	9.75@10.50
York, Pa.	8.00		90 to 95	2 to 7	10.75
CENTRAL:					
Alton, Ill.	10.50		94.0		
Delaware, O.			50.0	5-12	10.50
Forest, O.	7.50				
Knowles, Wis.		9.00	55	45	11.50
Manistique, Mich.	11.00		95	2	11.00
Marblehead, Ohio			54	16.0	9.75
Mitchell, Ind.	9.00				12.50
Springfield, Ohio			33.62	17.73	10.50
Woodville, Ohio		9.25	47-48	31-32	10.50
SOUTHERN:					
Blowers, Fla.	5.00	7.25	98.0		
Burns, Tenn.	9.50		96	0.54	13.00
Chippewa, Fla.	5.00		80.0	15.0	
Dittlinger, Texas		9.00@11.00	98.62	0.29	12.50@15.00
Erin, Tenn.	9.50		97.82	0.12	
Karo, Va.	8.00		97.0	1.26	
Lineton, Va.	8.50		97	1.74	
Lushing, Va.	9.00	11.25	60	15	12,75
Maxwell, Va.	6.00	9.00	88	1.75	
Newala, Ala.	8.50@9.00		99.33		
Ocala, Fla.	4.00	6.00 pulv.	98½	(dry basis)	
Staunton, Va.	7.50		96.48		
WESTERN:					
Bellins, Wash.					12.00
Colton, Calif.	4.50		97	2	15.00
Lime, Ore.	15.00		91.48	0.58	
Oscas Island, Wash.		5.50			16.50
San Francisco, Calif.					15.00
Tehachapi, Cal.	6.00	8.00	96	2	

Miscellaneous Sands

(Continued from preceding page)

Bridgeton, N. J.—Core	2.00
Cleveland, O.—Molding coarse	2.50
Brass molding	2.50
Molding fine	2.75
Columbus, O.—Core	2.00
Brass molding	2.50
Molding fine, steel molding	2.50
Conneaut, O.—	
Molding fine	2.75@3.00
Molding coarse	2.50@2.75
Eau Claire, Wis.—Core	2.25
Brass molding and sand blast	2.25
Fleetwood, Pa.—Furnace lining	2.25
Franklin, Pa.—Traction	2.50
Brass molding	2.75
Molding fine, steel molding	3.00
Molding, coarse	3.00
Sand blast	5.00
Core	2.50
Greenville, Ill.—Molding coarse red	1.60@1.80
Guion, Ark.—Molding fine	2.00@2.25
Roofing	3.00
Stone sawing	2.50
Hancock, Md.—Core and brass mldg.	1.65
Hellam, Pa.—Core	2.00@2.50
Joplin, Mo.—Stone sawing, flint	1.25
Kansas City, Mo.—Missouri River core	.85
Klondike and Gray Summit, Mo.—	
Molding fine	2.00@2.50
Lake Weir, Fla.—Sand blast	.60
Mapleton, Pa.—Molding, fine and core, damp	2.00@2.50
Molding, fine, dry	3.00
Massillon, O.—Molding fine	3.00
Molding coarse	3.00
Traction	2.75
Furnace lining	3.00
Core	3.00
Michigan City, Ind.—Core, bank	.50@.60
Traction	.50
Millington, Ill.—Roofing, stone sawing	2.00
Core and furnace lining	1.75
Core	1.50
Mineral Ridge, O.—Core, molding, sand blast, roofing, brass molding, etc., washed, screened (damp)	2.75
Montoursville, Pa.—Core	1.25@1.50
Traction	1.15@1.35
Brass molding	1.25
Ohio—Various points:	
Iron molding, fine	1.50@2.25
Iron molding, coarse	1.75
Brass molding, minimum	2.00
Oregon, Ill.—Core	1.75@3.00
Furnace lining	1.75@3.00
Sand blast	3.00@3.50
Molding fine	1.75@3.00
Ottawa, Ill.—Core, furnace lining, molding fine and coarse (washed and dried)	1.75@2.50
Core, furnace lining, molding fine (crude)	.75@1.00
Molding coarse (crude)	.75
Roofing line	1.75@3.00
Sand blast	3.00@5.00
Stone sawing	2.50
Traction	1.75@2.50
Brass molding	2.00@2.50
Providence, R. I.—Molding fine	2.00
Molding coarse	1.90
Brass molding	2.25
Sand blast	3.00@4.00
Sugar Grove, Ohio—Core (dried and screened)	2.00
Traction	2.00
Thayers, Pa.—Core and traction	2.00
Furnace lining, molding	1.25
Utica, Pa.—Core	2.00
Molding coarse, traction	2.50
Brass molding	2.75
Sand blast	3.50
Warwick, Ohio—Core, furnace lining, molding fine and coarse (dry and screened)	2.50@2.75
Core, furnace lining, molding fine and coarse (green)	2.25
Wedron, Ill.—Core, (crude silica)	.75@1.00
Molding fine, coarse	.75@1.00
West Albany, N. Y.—Molding fine	1.75@2.25
Molding coarse	1.50
Brass molding	1.75
Zanesville, Ohio—Molding fine and brass	2.50@2.75
Molding coarse	2.25@2.50

Gypsum, per Ton

Castalia, O.—Crushed, to cement mills	3.50
Ground, to cement mills	3.50
Land plaster	6.00
Bags extra—Jute, 3.00; ppr., 1.00 per ton.	
Fort Dodge, Ia., bulk	3.50
Garhutt, N. Y.—Land plaster, bags	7.50
Grand Rapids, Mich.—Crushed gypsum	4.50
Ground gypsum rock	9.00
Gypsumville, Man., Can. (crushed)	3.50
Oakfield, N. Y.	7.50
Sandusky, O.	6.00
Jute sacks, $3.00 extra; paper, $1.00 extra.	

Ground Rock Phosphate

Centerville, Tenn.—B. P. L., 70%; ton, 2000 lbs. (90% thru 100 mesh)	9.00@10.00
Lump rock. 72% to 75%, B. P. L.	6.00@8.50
Centreville, Tenn.—B. P. L., 60%	7.00
B. P. L., 70%	9.00@10.00
Gordonsburg, Tenn.—2000 lbs. (90% thru 100 mesh)—B. P. L., 60%	6.00
B. P. L., 65%	7.00
B. P. L., 70%	8.00@10.00
B. P. L., 75%	12.00
Mt. Pleasant, Tenn.—(B. P. L. 68%) 13%	7.00
14%	8.00
Mt. Pleasant, Tenn.—B. P. L., 70%	10.00
Nichols, Fla.—Pebble, B. P. L., 68%	10.00
Wales, Tenn. (95% thru 100 mesh) (guaranteed 14% phosphorus equivalent)	7.00@8.25
Walls, Tenn.—B. P. L., 70.2%—	
To County Agri. Assns.	7.50
To others	7.75

Florida Soft Phosphate

Croon, Fla.—Ground pebble, 30%	16.00
Pulverized soft, 26%	17.50
Jacksonville (Fla.) District	10.00@12.00
(Add 2.50 for sacks)	
Phoslime, Fla. (in burlap bags, 100-200 lbs.)	15.00

General News from Rock Products Markets

Consolidation of Louisiana Gravel Concerns

THE STATE GRAVEL CO., Inc., whose office is at 709 Gravier Street, and which has one of the largest deposits of gravel in the South, and is putting in a very large washing and screening plant at Amite, La., 69 miles north of New Orleans, on the Illinois Central Railroad, has leased and taken over all the properties of the Tioga Gravel Co., Ltd., at Alexandria. The State Co. will hereafter operate its property at Amite, La., and all the plants of Tioga Gravel Co., Ltd. The State Gravel Co., Inc., will maintain the former offices occupied by Tioga Gravel Co. I. I. Thomas will be manager of the Alexandria branch, and this branch will look after loading and shipping of all pit-run gravel.

The general offices of the company in New Orleans will be in charge of A. D. Alderson, president and manager of the company, with C. O. Harris as secretary and office manager. The Tioga Gravel Co. remains as a holding corporation and still owns its properties as heretofore and the officers of the Tioga company remain the same. All bookkeeping and collection work will be done in New Orleans and all shipping and correspondence in connection with pit-run gravel will be handled by the Alexandria office. The new company will not disturb any of the arrangements of the old company—in other words, the Tioga natural concreting and paving gravel will still be shipped from the same plants and looked after by the same office as in the past, according to a statement by President Alderson.

Commission on Car Service Asks Railways for Cars for Roadbuilding

CHAIRMAN KENDALL, of the commission on car service, established by the association of railway executives, has issued a circular addressed to all the railways, in which he asks for their assistance in meeting the extraordinary demand for cars to move roadbuilding materials. The circular reads in part as follows:

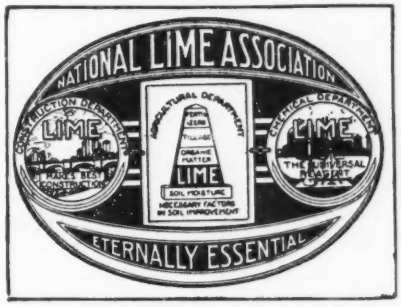
"Information reaching the Bureau of Public Roads of the U. S. Department of Agriculture, from various state highway commissions and from producers of materials used in road construction, indicates that there will be an extraordinarily heavy movement of these materials during the coming season. It is estimated that the road building this year will not be less than three times that of the heaviest previous season. The transportation demand will be accentuated by reason of the fact that much of the road construction will be in territory where stone, sand and gravel deposits are so located as to require abnormally long hauls.

"It seems to be apparent, from what has already been brought to our attention, that the handling of this business will require some co-operative action between individual railroads and the Commission on Car Service in order that maximum use of equipment and adequate service for this traffic may be secured. It is suggested, therefore, that individual carriers should, as promptly as possible, ascertain the demands that will be made upon them, and, in the event that relief seems necessary, the Commission on Car Service should be promptly advised of all the facts, so that the necessary steps may be taken looking to such readjustment of car movement as is possible in individual cases."

Lime Association's Insignia

THE NATIONAL LIME ASSOCIATION has adopted the emblem shown herewith. In connection with it the following comment is made:

"This insignia will bear a good deal of study. It is more than a trademark or an emblem of the National Lime Association. It is built up out of the insignia of each of the three departments of the Association. These separate insignia will be used to identify each of our three departments. Their inclusion in the Association insignia will keep always before the public the three-fold uses of lime with which we are concerned. Credit for suggesting the slogan 'Eternally Essential' is due to Director George B. Wood, of Maine.



New insignia and trade-mark of the National Lime Association

"The Association insignia will be used as a help in identifying our publications in the public mind. It may ultimately seem wise to use this insignia on the products of member companies as a mark of identification with the National Association and as a guarantee of quality."

New Ballast Producer for Norfolk & Western

J. SHIRLEY SMITH, of Roanoke, Va., has been conducting negotiations leading to the development of valuable granite deposits owned by him south of Roanoke on the Winston-Salem division of the Norfolk & Western Railway, has contracted with the Norfolk & Western Company to furnish them with 480,000 tons of crushed granite for ballasting.

The contract covers a period of three years, and the price obtained for the material will amount to more than a quarter million dollars. A survey has already been made for railroad sidetracks, and work will begin at once.

Mr. Smith has also associated himself with Altoona, Pa., capitalists who have contracted to quarry granite on his property for building purposes. The quality of the granite and the polish of which it is susceptible make these deposits desirable property.

Illinois Farmers Want Limestone and Phosphate Kept in Stock

THE FARM BUREAUS of many Illinois counties are trying to meet the increasing demand of farmers for limestone by encouraging elevator companies to keep it in stock.

W. B. Richards, agricultural agent for Kane county, says that most farmers want to use phosphate during the period from August to November, and because of the rush of orders at that time only a few can obtain it. It is necessary for it to be obtained at any time it may be procured, and kept in stock so that farmers can get it at their convenience.

The problem has been largely solved in Kankakee county by organizing cooperative associations throughout the county, which buy phosphate in carloads and store it in bins, and it is said that every farmer in the county is in reach of a station where he can get it, a wagon load at a time.

Mr. Fahrnkopf, the new associate adviser of McLean county, is putting on a special campaign to get elevators to handle limestone and phosphate, and the Champaign county bureau has already pledged many elevator companies to keep these materials in stock.

The opinion of farm advisers is that if farmers can be induced to use a load or two of these fertilizers they will see the benefits and will use them in increasing quantities.

General News from Rock Products Markets

Experimental Lime Plant and Testing Laboratory

E. SCHMATOLLA, chemical and combustion engineer, 217 Broadway, New York City, is building in Newark, N. J., an experimental and testing plant containing, besides other furnaces, a small lime kiln in which he can burn samples of lime rock (one or two barrels, either with direct or producer gas fire) under the same conditions as in large kilns, using, if desired, the same fuel which would be most economical, near the respective quarry.

Mr. Schmatolla writes:

"It will be understood that great losses of money and failures can be safely avoided by making such preliminary practical tests, before investing large amounts of money in construction or reconstruction (also before closing big contracts for coal).

"The experimental, demonstrating and testing plant will be equipped with a chemical laboratory in which practical analyses of rock, lime and fuel can be made quickly.

"Of course, in many cases where a certain lime rock has been burned in existing kilns, preliminary experiments or tests will not be necessary, before building or rebuilding kilns.

"It has been repeatedly proven that kilns reconstructed or newly built on my design or patents are saving about 50 per cent of coal and are much more productive compared with the old kilns, of which hundreds are still working in this country.

"Many kilns have been built or rebuilt successfully, using designs and patents which I have developed during more than twenty-five years of continuous work.

"I beg to offer you my services for the construction or improvement of lime kilns, hoping that you will be willing to encourage an expert who has devoted most of his life to your industry."

Professor Slipher Joins Lime Association Staff

PROFESSOR JOHN H. SLIPHER, of Purdue University, has been appointed to the staff of the Agricultural Department of the National Lime Association and began work on March 15 in line with the authorization of the Board of Directors at the January meeting.

Professor Slipher is a graduate of Ohio State University of several years' standing and has been in charge of the laboratory and advanced lecture instruction in soils in Purdue University at Lafayette, Ind. In making the announcement, Acting Secretary E. O. Fippin of the Association writes: "In his teaching he has shown much originality in dealing with problems of soil improvement and investigation. While he comes from a region where pulverized limestone for use on the soil has had very general preference, he still has been able to maintain an open mind and to have a thorough appreciation of the value and use of burnt lime materials for these purposes."

Professor Slipher will give attention particularly to field work and to relationships with the agricultural colleges, experiment stations and county agents. He will be available for lecture engagements. In addition he will assist in developing the bulletin program and in the preparation of material for the Agricultural Lime News Bulletin, the first issue of which will soon be ready for distribution.

Mississippi Valley Conditions

MEMPHIS, Tenn.—Practically every organized labor craft of the building trades is asking a higher scale on new contracts to be made the current year starting April 1; these increases for 8 hours' work run from 20 to 50 per cent over the union scale in effect in 1919. Bricklayers ask $1.25 per hour instead of $1, plumbers $10, lathers $1.25 per hour, electricians $1.25 per hour, stone cutters have asked 16 per cent raise over 87½c per hour.

Building activities, because of rains, are late, but prospects are good. The prices of all materials, including plaster, sand and gravel, are firm, and in good demand. There have been a few slight advances, including cement.

There was a session of the Southern Road Material and Contractors' Association, just being formed, at Memphis on Saturday, March 20. Crushed stone, sand and gravel producers and hard-surfaced road builders from Mississippi, Alabama and Arkansas were present. Thos. B. King, of the Chamber of Commerce, said one of the objects of the meeting was to obtain proper shipping facilities through concerted action.

Mineral Aggregate Resources of Indiana

ACCORDING TO REPORTS from 18 of the principal sand and gravel producing plants to the Indiana Sand and Gravel Producers Association the total amount of sand and gravel they have available for federal and road work is 1,900,000 tons, on the basis of 1919 production, or 2,280,000 tons on the basis of plant capacity.

The Chief Engineer of the State Highway Commission reports that over 46% of the coarse aggregate to be used in the State Highway program under contract will be gravel, 42% stone, and about 11% slag.

Conference on Mineral Aggregate Freight Rates

A MEETING was held recently in Indianapolis, Ind., at which the secretaries and traffic committee chairmen of the National Crushed Stone and Sand and Gravel Associations agreed to work out jointly facts and statistics showing just what General Order No. 28 did to freight rates on these commodities.

It is not the intention of these committees at the present time to take any stand against a proposed freight-rate increase unless such increase added to those already suffered can be proved excessive as compared with proposed increases on other commodities.

Ben Stone on Open-Top Car Situation

"WE HEAR AND READ all sorts of opinions these days about what is going to happen to our freight rates, car supply, etc. Most of it is speculative. Some is misleading. The transportation act places a great burden on the Interstate Commerce Commission, and it is not likely that the Commission will undertake to do anything until it has had time to thoroughly digest the provisions of the new law and clearly understand just what it contemplates. It appears to be reasonably certain that the Commission will assume an attitude of "hands off" in the matter of car distribution, except in cases of extreme emergency. The new car service committee appointed by the American Railroad Association will have to do with the allocation of equipment between carriers. In other words, this committee will prescribe rules to govern the interchange and use of equipment in respect of ownership. Furnishing of cars to shippers will be primarily a job for each individual railroad. It is hardly reasonable to expect that any road will agree to have shippers on its line deprived of cars of its ownership in order that shippers on another road may be taken care of. It has been said that Section 12 of Article 4 of the transportation act simply means that whenever the demand from coal mines exceeds the supply of cars, the interest of other classes of shippers will be wholly disregarded. We cannot feel that such was the intent of the article referred to, nor do we believe that such will be the effect. A specific provision governing the distribution of cars among mines during periods of car shortage was incorporated in the act in order to establish a uniform practice. It changes in no way the fundamental principle of the Interstate Commerce law which prohibits discrimination."—"Weekly Bulletin" of the Illinois Association of Sand and Gravel Producers.

Passed By The Screens

Incorporations

The Kelly Sand & Supply Co., Ephraim, N. Y., has been incorporated for $100,000.

The Universal Sand Co., New Castle, Pa., has been incorporated with a capital of $50,000.

The Flint Gravel Co., Wilmington, Del., has been incorporated for $100,000 by T. L. Groteau, M. A. Bruce and S. E. Dill of Wilmington.

The Manor Sand & Gravel Co., Philadelphia, Pa., has increased its capital stock from $50,000 to $200,000 preparatory to enlarging its facilities.

The Salida Granite Corporation has been incorporated under the laws of Colorado for $100,000 by W. L. Phibin and Ray Hanks, Salida, Colo.

The Utica Sand & Gravel Co., Utica, N. Y., has been incorporated for $10,000 by H. S. Greene, H. H. Buchanan and E. E. Sweet, all of Utica.

The Denver Plaster & Calcimine Co. has been incorporated under the laws of Colorado with a capital of $50,000 by P. H. Kinney and James M. Bailey of Denver, Colo.

The Red & Green Slate Products Co., Granville, N. Y., has been incorporated for $200,000 by W. J. Wanamaker, J. V. B. Roome and R. E. Jarrett of 205 West 107th street, New York City.

The Waupaca Sand and Gravel Co., Waupaca, Wis., has filed amendments to articles of incorporation to increase capital stock from $25,000 to $50,000. The company is erecting a sand and gravel washing plant at Binghamton, Wis.

The American Humus & Phosphate Co., Lakeland, Fla., has been incorporated for $300,000 by George F. von Konlits, president and treasurer; Edwin Spencer, Jr., secretary, and Lee Stephens, general manager. The purpose is to mine phosphate.

The Loncala Phosphate Co., Ocala, Fla., has been organized by English capitalists to take over and operate the properties of the Dutton Phosphate Co., which include 40,000 acres of land, drying and storing facilities and a shipping terminal at Jacksonville.

The Rockland and Rockport Lime Corp., Rockland, Maine, has been incorporated under the laws of the state of Maine to do quarrying, manufacture lime, etc. The capital stock will be composed of $850,000 common, $1,115,000 first preferred and $587,500 of second preferred.

The Richmond-Greenville Gravel Co., Greenville, Ohio, has been incorporated under the laws of Ohio to operate a plant at Richmond Ind., by F. D. Coppock, E. E. Patty, H. R. Brown, G. C. Baker and J. F. Coppock. The capital stock is $300,000 Ths is a subsidiary of the Greenville Gravel Co., of which Mr. Coppock is president

The Lippmann Stone Co., Milwaukee, Wis., has been incorporated under the laws of the state of Wisconsin to own and operate stone quarries, and to do construction work of streets, sewers, buildings, and to deal in fuel and building material. The capital stock is $200,000 and the incorporators are W. E. Lippmann, W. T. Landon and E. W. Landon.

Johnson, Drake and Piper, Inc., Minneapolis, Minn., has been incorporated under the laws of the state of Minnesota to do general construction, excavating, grading and to own and operate rock crushing plants and sand and gravel pits. The capital stock is $200,000 and the incorporators are A. F. Johnson, president; G. M. Drake, vice-president, and L. H. Piper, secretary and treasurer.

The State Crushed Granite Co., Minneapolis, Minn., has been incorporated under the laws of the state of Minnesota to quarry, mine and manufacture stone, granite, rock, gravel, sand and other mineral material products, to maintain, build and repair roads, sewers, bridges, water and power lines, etc. The capital stock is $100,000 and the incorporators are R. D. Brown, O. K. Carlson and N. M. Cronin.

Corvin & Co., Minneapolis, Minn., has been incorporated under the laws of the state of Minnesota for the purpose of acting as engineers, contractors, etc.; manufacturing iron, steel and cement products, road materials, etc.; to mine, quarry, cut, crush, finish, set, dress and prepare for market, stone, marble, sand, gravel, limestone, etc. The capital is $150,000 and the incorporators are James Corvin, president and treasurer; H. B. Henderson, vice-president and R. E. Lutz, secretary.

The Universal Granite Quarries Co., Chicago, Ill., has been licensed in Wisconsin to operate quarries in Waushara County.

The Independent Sand & Gravel Co., Milwaukee, Wis., has been incorporated for $15,000 by Frank Knop, Ed. T. Litz and Meta Litz, all of Milwaukee.

The B. G. & L. Sand and Gravel Co., Milwaukee, Wis., has been incorporated for $96,000 by Frank A. Becker, William Goelz and William Lietz, all of Milwaukee.

The Bath Portland Cement Co., Philadelphia, Pa., has increased its capital stock from $700,000 to $2,500,000, the money to be used in the construction of a new mill near Easton, Pa. Louis Rapperto, Philadelphia, is president.

The River Products Co., Iowa City, Iowa, has been incorporated for $20,000 to quarry rock, sand and gravel and to manufacture cement and building materials. The incorporators are Stanley M. Hands, president; Harold L. Hands, vice-president; George McCollister, secretary, and W. F. McRoberts, treasurer, all of Iowa City.

The Locke Slate Products Corporation, Fair Haven, Vt., has been incorporated for $50,000. The company takes the rights of N. Louise Locke at Hampton, N. Y. The subscribers are H. N. Locke, Fair Haven; F. W. Locke, Poultney; C. B. Locke, New Haven; F. F. Locke, Poultney; George M. Mahan, Hydeville, Vt.

Sand and Gravel

The City of Red Wing, Minn., has appropriated $6,000 to equip a municipal gravel plant.

The Haselton Stone & Sand Co., Haselton, O., has applied for permission to increase its capital stock from $50,000 to $75,000.

The Millwood White Sand Co., Millwood, O., owned by C. D. Jones, Jackson, Ohio, lost its plant by fire on February 20. The loss is estimated at $30,000.

The Superior Sand & Gravel Co., Detroit, Mich., has had plans prepared for a 2-story brick, reinforced-concrete and steel warehouse at Lycaste Avenue and the Detroit River.

The Bloedel Fuel Co., Fond du Lac, Wis., has opened a new sand and gravel pit in the town of Taycheedah, Wis. This company is just adding sand and gravel to other building materials which it sells.

The River Sand and Gravel Co., of Owensboro, Ky., has greatly increased its facilities and is in a position to produce between 500,000 and 600,000 cu. yd. this season. It is stated that the present price is $1.25 per cu. yd. for both sand and gravel.

The United Materials Co., St. Paul, Minn., will very shortly start the operation of a large new plant at that place. It will be modern throughout and will have a daily capacity of approximately 3,000 tons. The gravel deposit on the United Material Co. property is estimated to contain 110,000,000 cu. yds. of sand and gravel. Practically the entire season's output has already been contracted for.

The Detroit-Oxford Gravel & Stone Co., Oxford, Mich., at its recent annual meeting, elected W. O. Smith president and general manager, John Ryan vice-president, and R. H. Smith secretary, treasurer and assistant manager. F. R. Banks continues as superintendent. It is said 1919 was a very successful year for the company and various extensions are being made this year to care for increased business.

The Wayne Steel and Iron Co., of Pennsylvania, is reported to have secured options on property near Fullerville, N. Y., with the intention of developing a sand deposit rich in iron. A local paper states: "The effort to extract the valuable minerals known to exist in the sand recalls the movement started about fifteen years ago to separate the gold by means of grinding and quicksilver precipitation and a large amount of capital was invested and subsequently lost. It is stated, however, that with the adoption of the magnetic plan of separation, the materials can be secured at a greatly reduced expense. Local men interested in mining operations are of the opinion that if the iron exists in the sand to the extent of ten per cent that the new venture bids fair to prove a paying proposition and the outcome will be watched with much interest."

Racine County, Wisconsin, has purchased a drag-line outfit and will erect a sand and gravel plant at a pit in Rochester.

The Stewart Sand Co., Kansas City, Mo., is negotiating for the lease from the city of three acres of additional water front property in order to expand its sand and gravel production facilities.

Ralph Nichols & Co., Renton, Wash., are contemplating extensive improvements to their sand and gravel property on the Cedar River. The demand for sand, gravel and building materials generally is said to be developing very rapidly in the Northwest.

The DeGraff Gravel Co., DeGraff, Ohio, is purchasing and installing equipment for a sand and gravel plant. The following officers have been chosen: President, D. E. Strayer; vice-president, G. E. Lockhart; secretary-treasurer, L. H. Casebolt; directors, D. E. Strayer, G. E. Lockhart, Andrew Mohr, Dr. O. W. Loffer, Charles Terrel, C. M. Brown, William Ward.

Quarries

The Provincial Stone & Supply Co., Ltd., and the Point Anne Quarries Co., Ltd., offices in the McKinnon Bldg., Toronto, Ont., were badly damaged by fire on March 5.

W. A. McLean, Deputy Minister of Highways, Toronto, is advertising for 150,000 tons of crushed stone to be delivered prior to January 1, 1921. Tenders close March 22, 1920.

The General Pulverized Limestone Co., Columbia, N. J., has leased the former power plant of the Eastern Pennsylvania Power Co., and will use the structure for general plant service.

The Duluth Crushed Stone Co., Duluth, Minn., has purchased 160 acres of hillside property at Gary, Minn., and will let contracts in the near future for the erection of a new crushing plant, homes for employes and a workingmen's hotel. The new crusher will have a capacity of 3,000 tons every ten hours. The capacity of the old crusher is 700 tons in ten hours. The new buildings will have a concrete base and the superstructure will be of timber with steel reinforcement. The latest type of crushing machinery will be installed. Under a recent amendment to the articles of incorporation the Duluth Crushed Stone Company has increased its life until 1950 and increased its capital stock to $300,000. The company was originally incorporated for thirty years in 1903. F. A. Brewer is president and C. D. Brewer, secretary-treasurer.

The Rock-Cut Stone Co., Syracuse, N. Y., is reported to have secured the option on 300 acres of limestone quarry land at Oakes Corners, near Geneva, N. Y. A local paper states: "Announcement is made by W. B. Thrall, of the company, that if final physical and chemical tests show the rock to be high grade and the elevation of the land is found to favor practical development a gravity rock crushing plant of large capacity will be installed. Engineers estimate that there is ample rock for an output of 50 cars per day for 50 years. With a view to locating a quarry in this section to supply broken stone and agricultural lime the company has had several locations in Seneca and Ontario counties examined by engineers and geologists during the last five years. Following these investigations Mr. Thrall secured the Oaks Corners options.

The Bessemer Limestone & Cement Co., Youngstown, Ohio, has made arrangements to move its offices from Youngstown to Bessemer, near the quarries. The company will erect a modern office building at Bessemer. At the first annual meeting of the company, which was recently formed to take over the Bessemer Limestone Co., G. G. Treat was elected secretary and treasurer and Henry A. Butler was added to the board of directors. Mr. Treat was formerly secretary and assistant treasurer and replaces John R. Rowland, retired, as treasurer. The company markets annually about 800,000 tons of limestone, 600,000 tons of which are supplied to blast furnaces in the Mahoning and Shenango valleys to be used as blast furnace flux. It is erecting a new cement plant at its properties, Bessemer, Pa., to have an annual capacity of 1,000,000 bbl. Directors and officers were re-elected. John Tod is president and Fred R. Kanengeiser is vice-president and general manager

The Reed Stone Co., Bedford, Ind., has filed a preliminary certificate of dissolution.

The Allen County, Ohio, quarry men have organized the Allen County Crushed-Stone Association to boost for better county roads.

The Walker Cut Stone Co., Tacoma, Wash., reports the best business ever. The company's plant is adding facilities for increased business.

The Consolidated Stone Co., Bedford, Ind., suffered a loss of about $50,000 when its stone sawmill No. 2 was destroyed by fire, February 14.

The Great Western Tufta & Cement Co., Mesa, Arizona, has been organized to operate building stone quarries at Kirkland, Yavapai County, Arizona.

The Limestone Quarries Co., Delphos, Ohio, has purchased a twelve-acre tract of land from Nicholas Hohenbrink in order to extend its operations.

The Warren Soapstone Co., Phillipsburg, N. J., is maintaining operations at good capacity at its plant, and is installing new electrical and other equipment.

The Kentucky Rock Asphalt Co., Bowling Green, Ky., has increased its capital stock from $1,000,000 to $1,500,000 and plans to double the capacity of its plant.

The J. E. Baker Co., Marietta, Pa., is dismantling its quarry at Chickies, near Marietta, and will remove the equipment to another location. It is said that the stone and dolomite found in this district are not up to the required standard.

Bert Ross, owner and operator of the rock quarry southeast of Ottawa, Kan., has recently installed a new rock crusher and will now be able to supply crushed material for concrete work as well as quarried stone for building purposes. Mr. Ross has been figuring with the city on getting electric power transmitted to his quarry.

The General Rock Products Co., which operates limestone and dolomite quarries in York, Pa., and which plans to do a general business in foundry sands, burnt lime and foundry equipment, recently opened an office in Room 628 Oliver Building, Pittsburgh. Paul B. Reinhold, formerly in the sales department of the Crucible Steel Co. of America, Pittsburgh, is president of the company.

Richard Wilson and others of Beaver, Penn., have organized a company to build a limestone pulverizing plant at Vanport, Penn. They expect the plant to be in operation by late spring. New and up to date machinery, electrically driven, is to be installed, and the promoters will endeavor to establish a plant at which farmers may procure agricultural limestone in bulk at any time in the year. Richard Wilson, under whose direction the plant will be operated, said that the limestone will be dried and so finely pulverized that 95 per cent of it will pass through a 50-mesh screen.

The C. B. Kimberly Co., Wheeling, W. Va., is arranging plans for the operation of a large limestone quarry at Mt. de Chantal. The company has a six-acre tract in this section and proposes to install a modern quarrying and crushing works. The crusher plant will be used for the production of sand and small crushed stone as used in building operations. A siding will be constructed from the line of the Baltimore & Ohio R. R., and it is proposed to commence the machinery installation at an early date. A tract of coal land will also be developed in connection with the enterprise.

Gantts Quarry at Sylacauga, Ala., has changed hands. This quarry is a producer of famous Alabama marble and was formerly owned by New York capitalists. The new officers are: J. S. Sewell, president; W. H. Runger, manager; H. M. King, assistant manager; S. E. Hiller, general sales manager; R. M. Gardner, secretary, and W. P. Harrison, treasurer. For many years the major part of the product of Gantt's quarry has been used in New York and Chicago in the construction of some of the most imposing buildings in those cities. A number of the South's most handsome structures are finished in this Talladega County marble. During the world war this local industry was seriously crippled, but with an additional new opening and enlarged activities the output will be materially increased under the new management.

Lime

The Cristaline Lime Co., Orofino, Idaho, is planning the construction of $100,000 lime plant.

Orofino, Idaho, has a limestone deposit which is about to be developed according to local papers. Work will be started at once on a $100,000 lime plant.

The O. C. Barber Lime and Limestone Plant near Castalia, Ohio, may be taken over by a co-operative association of Erie County farmers, according to a Sandusky dispatch.

The Fischer Lime & Cement Co., of Memphis, Tenn., has just made plans for the immediate construction of a new warehouse along the Southern R. R. and at their present location 269 Walnut St., corner of Linden Ave., that will cost $150,000, to be of reinforced c 84x300 feet. The plans call for a two-story structure with a basement. The Fischer Lime & Cement Co. began business in Memphis in 1906 and represent a steady growth. Their present buildings in Memphis are thoroughly up to date and they also have large cement, lime and clay products material interests at Little Rock, Ark., and Greenville, Miss. Of the Memphis firm, W. W. Fischer is president; W. M. Fry, vice-president and E. Hatfield, secretary and treasurer.

Cement

The Phoenix Portland Cement Co., Nazareth, Penn., has begun work on an addition to cost $100,000.

The Alsen's American Portland Cement Works and the Alpha Portland Cement Co. have both given their employes a 3c per hour raise.

The Town of Huntington, N. Y., on Long Island, recently placed orders for 50,000 bbls. of cement for use in highway improvement. This town recently voted to bond itself for $500,000 for good roads.

The Giant Portland Cement Co. recently held its annual meeting in Wilmington, Del., and elected Charles J. Rhoads a director to succeed Gerald Holsman, resigned. All other directors and officers were re-elected.

The New York & New England Cement & Lime Co., Hudson, N. Y., and other Hudson River cement plants, were obliged to shut down during February on account of the snow fall, and the resulting shortage of coal.

The Los Angeles City Cement Plant at Monolith, Calif., is still in the hands of the municipal authorities, who are undecided whether to lease it to a Portland, Ore., company headed by Fred A. Ballin, or not. One councilman is urging the city to keep the plant to use as a club to hold down the price of cement it will want to purchase in the future.

The Canada Cement Co., Ltd., Montreal, will enter into active competition with the big steel corporations by transferring their Longue Point million-dollar plant into a steel rolling mill. A prominent steel man from the United States has been engaged to take charge of this branch. The cement company is at present suffering from a shortage of barrels.

The Federal Portland Cement Co., the incorporation of which, under the laws of the State of Maine, was noted in Rock Products of January 31, 1920, p. 49, will have its plant and quarries at Rutland, Iowa, and general offices at Fort Dodge, Iowa. The construction of the plant is under way and will be ready for operation the early part of next year. The officers of the company are Robert Healy, president; Fort Dodge, Iowa; Edw. J. Dalton, vice-president, treasurer and general manager, La Salle, Ill., and H. E. Treleven, secretary, Fort Dodge, Iowa.

The plant of the former St. Mary's Cement Co., Ltd., St. Marys, Ont., is producing a new product. This is super-cement, the invention of an Englishman named Goddard. It was used effectively by the British government during the war for petrol tanks and other construction work and is a waterproof material with greater tensile strength than ordinary cement. Rights for United States and Canada are held by Monk, Manhard & Dawson, Montreal, who will put up a plant for the manufacture of the special compound used with cement to make super-cement. It is at present being made at St. Mary's, but will ultimately be produced on a large scale for sale to cement companies generally.

Gypsum Products

The United States Gypsum Co.'s plaster plant at 1714 Merwin Ave., Cleveland, Ohio, was destroyed by fire, February 12, with a loss estimated at $200,000. The fire is believed to have started in a dryer. The flames quickly spread through the plant, and burned a two-story frame building, 50 by 300 ft. A large amount of finished stock was destroyed. The plant will be rebuilt at once.

Slag

The Birmingham Slag Co., Birmingham, Ala., is preparing plans for a new plant at Gadsden, Ala. The company is planning to produce 20 to 30 cars of crushed and screened slag at this new plant.

Retail Dealers

The Canadian Stucco Wall-Board Mfg. Co., Ltd., Victoria, B. C., has been incorporated with a capital of $50,000.

The Victoria Self-Locking Concrete Wall & Construction Co., Ltd., Victoria, B. C., has been incorporated with a capital of $45,000.

The Granite City Pressed Brick & Stone Co., Springfield, Mass., has been incorporated for $250,000. The directors are: H. H. Halliday, president; John S. Macmillan, 25 Kimberly ave., Springfield, and George A. Bacon.

The Flex-or Crete Mfg. Co., Boston, Mass., has been incorporated to deal in building material. The capital stock is $100,000. The directors are: Edgar R. Taylor, president; Frank H. Woodman, Wellesley, Mass., treasurer, and Isidor Flexner.

The Dressler-Shepley Co. of Massillon, Ohio, has been organized for the purpose of conducting a retail coal, sand and gravel business, it was announced recently by Jerome F. Shepley, who, with Frank J. Dressler, is promoting the company. The company has leased several acres of land on the north end of the property owned by the Rhodes Bottle & Glass Co., north end of the city, and will install a modern material yard.

The Independent Concrete Pipe Co., Ltd., formed a few months ago by John E. Russell and others of Toronto, has taken over the plant of the B. Blair Co., Guelph. Mr. Blair is president and manager of the new company. John E. Russell Co., Toronto, are general agents for the company, which will manufacture bell-end sewer pipe, pressure pipe, culvert pipe, drain tile and other concrete products. A McCracken machine for the manufacture of cement glazed sewer pipe has been installed and all pipe will be manufactured in accordance with the specifications of the American Society for Testing Materials. The company has secured the right to manufacture lock-joint pipe in Ontario.

Personals

J. O. Greenway, formerly county drainage engineer at Yakima, Wash., is now with the Washington Brick & Lime Co., Spokane, Wash., as plant superintendent.

Henry Angel, general sales manager of the Kelley Island Lime & Transport Co., Cleveland, Ohio, has returned to his office, completely recovered from illness that kept him away from business for several months.

Manufacturers

R. C. Pierce has been appointed district manager for the Stephens-Adamson Co. of Aurora, Ill., with office at 412-414 East Third street, Los Angeles, Cal. The following announcement is made in this connection: "Larke stocks of standard S-A equipment and supplies are carried ready for quick delivery. The Los Angeles district engineering department will be maintained to assist customers and prospective customers in the design of elevating, conveying and screening machinery. Engineers thoroughly competent and experienced, who have an intimate knoweldge of S-A machinery and its many adaptations, will be available for consultation."

E. R. Marker has taken over the New York office of the T. L. Smith Co., Milwaukee, Wis., and has already established himself in offices and big show room space on the ground floor of the Hudson Terminal Building at 50 Church street. Shipments of all sizes of mixers, pavers, pumps, as well as all repair parts will be made directly from the eastern warehouse, located at 122 Lilly street, Newark, N. J. Mr. Marker is well known in the East and has a wide knowledge of the contractors' equipment field. He has been identified with the T. L. Smith Co. for seven years. For four years he had charge of the Milwaukee district office and for the following three he occupied the position of sales manager operating through the Milwaukee office. Under his direction the sales of the company have increased over 150 per cent and it holds the distinction of being the only concrete mixer concern that did not show a falling off of sales during the war time period, it is claimed.

USED EQUIPMENT

Rates for advertising in the Used Equipment Department: $2.50 per column inch per insertion. Minimum charge, $2.50. Please send check with your order. These ads must be paid in advance of insertion.

FOR SALE

1—No. 7½ Austin Crusher, almost new.
1—Class "G" Duplex Air Compressor, capacity 925 F.P.M.
1—Class "H" Duplex Air Compressor, capacity 342 cu. ft. per min.
1—14 x 20 Atlas Plain Side Crank Steam Engine.
1—14 x 20 Russell Side Crank Steam Engine.
1—11 x 16 Side Crank Steam Engine.
1—Model "G" Marion Steam Shovel, good condition, low price.
1—17 x 24—4-4-0 American Passenger Locomotive.
1—10 x 16—36" gauge Vulcan Saddle Tank Locomotive. (Boiler needs overhauling.)
2—13-Ton Standard gauge Whitcomb Gasoline Locomotives.
1—10-Ton Superior Stone Grapple.
1—40" x 13' Revolving Screen.
1—Well Drill.

THE CASPARIS STONE CO.
Clinton Bldg., Columbus, Ohio

FOR SALE

1—1¼ yd. Negley Slack Line Bucket, Carriage, and 550' 1¼" Yellow Strand Cable. Good condition.

1—10" Manganese Steel Sand Pump, belt driven, with suction pipe and long curved elbow.

THE CARMICHAEL GRAVEL COMPANY
700 Rialto Building, St. Louis, Missouri
(Also—Williamsport, Indiana)

Miscellaneous

Capital Wanted

to equip a High Calcium Limestone property; practically inexhaustible supply of stone; no stripping; on railroad and near Barge Canal; contract available for output, or will lease property.

Box 1393 **Care of Rock Products**

Your Prospective Customers
are listed in our Catalog of 99% guaranteed Mailing Lists. It also contains vital suggestions how to advertise and sell profitably by mail. Counts and prices given on 9000 different national Lists, covering all classes; for instance, Farmers, Noodle Mfrs., Hardware Dirs., Zinc Mines, etc. *This valuable reference book free.* Write for it.

Send Them Sales Letters
You can produce sales or inquiries with personal letters. Many concerns all over U. S. are profitably using Sales Letters we write. Send for *free* instructive booklet, "*Value of Sales Letters.*"

Ross-Gould Mailing Lists St. Louis

Wanted

Steam Driven, Locomotive Type Air Compressor to attach to steam shovel for Rock Work. To deliver 100 cu. ft. A. P. M. against pressure of from 80 to 100 lbs.

Security Cement and Lime Company
Hagerstown, Md.

Immediate Delivery

10K GATES, mang. fitted. Reg. drive, 50 ft. elev. 2 screens. **All $8500.00.** Prac. new.
20—Crushers, Nos. 2 to 10 mostly Gates.
1—327 HP. W. T. Boiler. $8.00 HP.
9—150 HP. 125 lb. H.R.T. boilers, butt strap.
2—48"x12' Taylor Manganese screens.
25—Air compressors, 60 to 4000 cu. ft.
50—Steam engines, 30 to 1500 HP.
1—95 HP. Loco. type boiler. Ill. ship.
75—Steam and Centrifugal Pumps.
1—30-60 HP. Emerson-Brantingham tractor.
Concrete mixers—Contractors Equip.
Send us your inquiries for electrical equip., engines, hoists, etc.

Ross Power Equipment Co.
Indianapolis, Ind.

FOR SALE

Slightly used No. 1 Jeffrey Junior Lime Pulverizer.

AIR REDUCTION SALES CO.
31st and Homan Chicago, Ill.
Telephone Lawndale 6513

WANTED

6-9 ton locomotive; 3 ft. gauge; double friction hoist; 4000 lb. cap.

Box 1392 **Care of Rock Products**

WANTED

Four hundred feet of 24", 6-ply rubber belt.

BELOIT SAND & GRAVEL CO.
519 Ashton Bldg. **Rockford, Ill.**

Buckets and Skips

1—1¼ yd. Class "E" Hayward Clam Shell.
1—1¼ yd. Multipower Hayward Orange Peel.
20—4 yd. extra heavy 4-chain steel skips.

Channeling Machines

1—H8 Ingersoll-Rand with boiler.
1—H8 Ingersoll-Rand without boiler.
1—H8 Sullivan with boiler.

Crushers

1—No. 5 K Gates Gyratory manganese fitted.
1—No. 7½ K Gates Gyratory manganese fitted.
1—No. 21 K Gates Gyratory manganese fitted.
1—60x84 P. & M. Superior Jaw.

Derricks

1—15-ton American Steel Guy Derrick, 100-ft. boom, 115-ft. mast, 16-ft. bull wheel.
1— 3-ton American Self-Slewing Steel Guy Derrick, with 60-ft. horizontal boom. Engine mounted on mast. (Derricks offered with or without guy or hoisting ropes.)

Hoists

1— 8¼x10 d.c. d. and Swinger Lidgerwood.
1— 9 x10 d.c. d. d. and Swinger Lidgerwood.
1—10½x12 d.c. d. d. and Swinger Lambert.
1—60-H.P. d.d. and Swinger Lambert Electric.

Locomotives (Stand. Gage)

1—12x18, 4 wh. American Saddle Tank.
3—13x18, 4 wh. American Saddle Tank.
1—14x22, 4 wh. American Saddle Tank.

Sand Rolls

2—48x16-in. Allis Chalmers "Anaconda" type.
3—54x24-in. Allis Chalmers "Anaconda" type.

Steam Shovels

1—No. 69 Osgood 2½-yd. Dipper.
1— 70-C Bucyrus 2 -yd. Dipper.
1— 95-C Bucyrus 3½-yd. Dipper.
1—100-C Bucyrus 3½-yd. Dipper.

Also Compressors, Locomotive and Road Cranes, Rock Drills, Pumps, Screens, Wire Rope and Quarry Equipment.

T. H. LETSON CO.
Church and Fulton Sts.
New York, N. Y.

New—RAILS—Relaying

All sections on hand for quick shipment. Reasonable prices quoted. Our stock is very complete.

M. K. FRANK
Frick Building **Pittsburgh, Pa.**

FOR SALE

One Hammer Mill Pulverizer, rebuilt; absolutely as good as new; will sell at low cash price; can be inspected in Chicago.

Box 1386 **Care of Rock Products**

Repaired Contractors' Equipment

Steam Shovels

Model 60 Marion Shovels, 2½-yard dippers, Nos. 1999, 2059

1—Model 70 Marion, 2½-yd. dipper, Shop No. 2693.

1—Model O Thew, ½-yard dipper, full revolving, on traction wheels.

Hoisting Engines

1—8½ x 10 DC 2-D Lambert, with boiler

1—6 x 10" DC 2-D Byers.

1—6¼ x 10 DC 2-D Mundy, with attached swinger and boiler

Cableway

1—Lidgerwood Cableway, 1164-ft. span, with 9 x 10" DC Reversible Link Motion Cableway Engine, 3-ton capacity

We have a large stock of thoroughly repaired Construction Equipment of all kinds ready for immediate shipment.

Locomotives

1—3-ton Fate gasoline locomotive, 36" gauge.

1—14 x 20" standard gauge saddle tank Locomotive.

2—American 10 x 16" Locomotives, 36" gauge, with butt joint boilers

4—18-ton 10 x 16" Dinkeys, 36" gauge

Clam Shell Buckets

1—1½-yard Browning.

Cars

20—12-yard Western Air Dump, standard gauge, 26 ft. bed.

H. KLEINHANS COMPANY

Union Arcade **Pittsburgh, Pa.**

CLASSIFIED ADVERTISING

Rates for advertising in the Classified Department: $2.50 per column inch per insertion. Minimum charge, $2.50. Please send check with your order. These ads must be paid in advance of insertion.

Plants For Sale

FOR SALE

Excellent Marl Plant near New Bern, N. C. Apply

N. C. DEPT. OF AGRICULTURE
Raleigh, N. C.

FOR SALE

Extension gravel proposition in N. W. Iowa. Two different formations, 60 to 80 ft. deep. Adjoining R. R. Practically no grading for sidetrack. Water and electricity available. One-half mile to city limits. High testing material. Strictly first class proposition. Priced reasonable. Address

Box 1389 **Care of Rock Products**

For Sale or Lease

Crushed stone plant, capacity 800 tons per day, fully equipped, 30 ft. ledge, light stone, no stripping, best in Missouri, no competition. Address

Box 1390 **Care of Rock Products**

For Immediate Sale

Best rock quarry and stone crushing plant in the South, 1600 foot face, 60 feet deep to level, unlimited depth. Market assured and plenty of labor cheap. Owner in bad health. On three railroads —L. & N., I. C. and T. C. R. R.

HENRY J. STITES
Box 15 **Hopkinsville, Ky.**
Attorney for Owner.

Situation Wanted

WANTED

Position as sales manager of agricultural limestone plant. Experienced. References. Address

Box 1394 **Care of Rock Products**

Help Wanted

WANTED

Quarry Superintendent in Chicago District. Familiar with operation of steam shovels and large crushers. Permanent position to right party. State experience and furnish references. Address

Box 1391 **Care of Rock Products**

WANTED

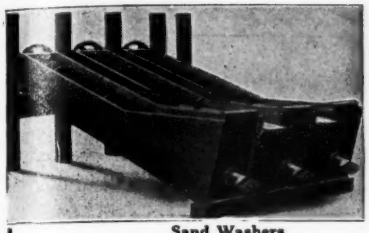
Practical quarry man with some capital to superintend the production. This is a good proposition, as we are located two miles from Milwaukee, and can deliver from bin to job by truck. We also have shipping facilities. Address

Box 1395 **Care of Rock Products**

WANTED

A quarry foreman. One who understands blasting and can get results. Quarry located two miles from Milwaukee. Address

Box 1396 **Care of Rock Products**



Sand Washers

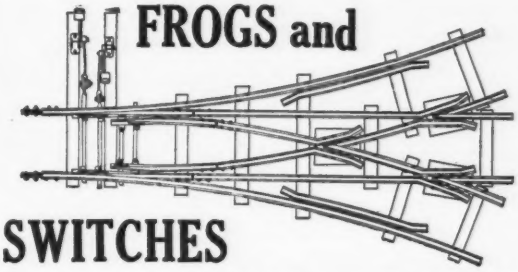
9-Foot Dry Pan

Lewistown Foundry & Machine Co.
LEWISTOWN, PA.

Builders of heavy duty crushers and glass sand machinery. Glass sand plants equipped complete.

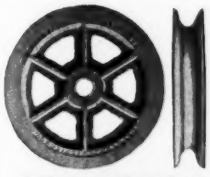
Write for prices and catalog

FROGS and SWITCHES



The Central Frog & Switch Co., Cincinnati, O.

Frogs, Switches, Crossings, Switch Stands, Rails, Angle Bars, Fishplates, Throws, Rail Braces, Tie Plates, Portable Track, Etc., Etc.



STOP
THE INTERRUPTION
→ INCREASE ←
THE PRODUCTION
of Your Plant By Installing

SUPERIOR NON-ROP-WER SHEAVES

They reduce rope wear to a minimum. Save power and insure safety. *Increases Hoisting Efficiency.* They cost no more than ordinary sheaves. Write for booklet today.

Mayer-Hasseldiek Mfg. Co.
Main, Wash and Commercial Sts. St. Louis, Mo.

PERFORATED SCREENS
MADE TO SUIT YOUR REQUIREMENTS
Let Us Quote Prices
Service and Quality

NORTMANN-DUFFKE CO.
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PORTER LOCOMOTIVES
STEAM & COMPRESSED AIR
WRITE FOR CATALOGUE
H.K.PORTER Co.
Pittsburgh, Pa.

Robins Conveying Machinery

is handling limestone, clinker, cement in bulk and in bags, gypsum, sand, gravel, crushed stone and many similar materials. Write for a copy of the Robins Handbook of Conveyor Practice and learn more about the Robins System.

Robins Conveying Belt Company
Park Row Bldg. New York City

Chicago, Ill., Old Colony Bldg.
Pittsburgh, Pa., Union Arcade Bldg.
San Francisco, Cal. The Griffen Co., Holbrook Bldg.
Birmingham, Ala. C. B. Davis Eng. Co., Brown Marx Bldg.
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ANCHOR BRAND COLORS

For Mortar, Cement and Brick—
Brown, Black, Red and Buff
—Strongest and Most Durable

Manufactured by

C. K. Williams & Co.
Correspondence Solicited EASTON, PA., U. S. A.

American Wire Rope

FOR elevators, dredges, lumbering, mining, oil-well drilling, suspension bridges, stump-pulling, cranes, derricks, ship's rigging and every other form of wire rope use.

Ask for illustrated catalogue

American Steel & Wire Company
Chicago, New York, Cleveland, Pittsburgh, Worcester, Denver
Export Representative: U. S. Steel Products Co., New York
Pacific Coast Representative: U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle

SAUERMAN
DRAGLINE CABLEWAY EXCAVATORS

THE long reach of a Sauerman Dragline Cableway Excavator enables it to dig to any depth and handle the sand and gravel from pit to plant direct without the help of auxiliary conveying equipment. You can see for yourself what a saving can be effected by using one machine instead of a combination of machinery. Want our catalog?

SAUERMAN BROS.
1140 Monadnock Block, Chicago

dig, convey, elevate & dump in one continuous movement under complete control of one man

Locomotive Cranes

Special Cranes

Rotating Tower Cranes

Any Size or Capacity. Hand or Electrically Operated. Stationary or Traveling.

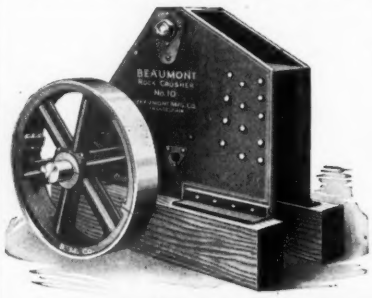
Let Us Know Your Requirements

The American Crane & Engineering Co.
Toledo, Ohio

The Baldwin Locomotive Works
Philadelphia, Pa.

Steam and Gasoline LOCOMOTIVES
for
Industrial Service

BEAUMONT ROCK CRUSHERS

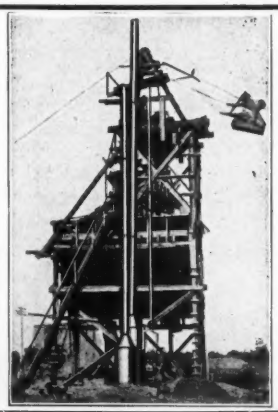


Rugged, simple, durable, efficient. Made in standard sizes; steel plate construction.

Write for booklet No. 42, and prices.

BEAUMONT MFG. COMPANY
326 Arch Street
Philadelphia

Mfrs. of Road Building Machinery, Crushers, Graders



Our Engineers Will Design Your

Sand and Gravel Plant

We would appreciate an opportunity to quote on your requirements.

The Cable Excavator Co.
Commercial Trust Bldg.
PHILADELPHIA, PA.

BROWNING LOCOMOTIVE CRANES
"The All-Around Champions"

BROWNING "Buckets That Bite"
Both are time and money savers

Write for Catalogs

THE BROWNING CO.
Cleveland, Ohio
Sales Offices:
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EASTON CARS

Gable bottom cars in standard and special designs, with and without brakes, hand or electrically controlled—and any other kind of an industrial car you could use to advantage.

EASTON CAR & CONS'T'N CO.

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CEMENT MAKING MACHINERY
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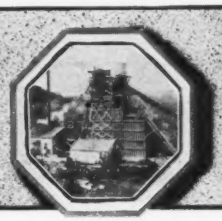
FLINT PEBBLES—SILEX LINING
THE LENIX BELT DRIVE

J. C. BUCKBEE CO.

Engineers

First National Bank Building
CHICAGO



We solicit inquiries from those who contemplate constructing complete cement, crushed stone, agricultural stone, lime burning and gravel plants, or remodeling their present installations.

What we have done in putting other plants on an efficient, paying basis we can do for yours Details are ready for your consideration.

Examinations, appraisals and reports made for purposes of finance and income tax returns.

We are prepared to finance meritorious properties.

Pierce J. McAuliffe

55 Liberty Street, New York

Member American Society Mechanical Engineers
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Design Construction Operation

Sand and Gravel Plants
Dredges
Hydraulic Excavating Equipment

Hydraulic dredging equipment of my design now operating has annual capacity of over 25,000,000 cu. yds. Make use of the experience gained by 15 years' intensive study of problems of pumping solids before deciding upon the equipment for your new plant or the rehabilitation of your present plant.

Robert W. Hunt Jno. J. Cone Jas. C. Hallsted D. W. McNaugher

ROBERT W. HUNT & CO.

Inspection—Tests—Consultation

Inspection New and Second Hand Machinery, Pumps, Crushers, Steam Shovels, Cars, Locomotives, Rails and Quarry and Contractors' Equipment

INSPECTION AND TESTS OF SAND, GRAVEL, CEMENT, STRUCTURAL STEEL, CASTINGS AND CONSTRUCTION MATERIALS

Cement, Chemical and Physical Testing Laboratories

New York CHICAGO Pittsburgh
St. Louis Kansas City Cincinnati San Francisco

The Fuller Engineering Co.

Designing, Constructing and Operating Engineers

Analytical Chemists

Cement and Hydrated Lime Plants a Specialty

Offices: Allentown National Bank Building
ALLENTOWN, PENNSYLVANIA

We Design and Equip Complete Plants

for the manufacture of gypsum products, such as wall plaster, moulding plaster, wall board products, gypsum block products, also mixing plants.

We are prepared to furnish complete machinery-equipment and design and furnish plans for the installation. Consult our Engineering Department. Forty years' experience in designing of wall plaster machinery and plants.

The J. B. Ehrsam & Sons Mfg. Co.

Engineers, Machinists and Founders

Enterprise, Kansas

The Advance Engineering Company

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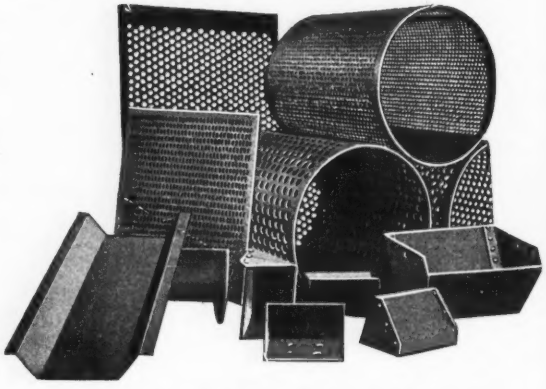
The "ADEN" Crane and Bucket

Special Interest to Sewer Contractors and Special Excavation Problems

E. 140th St. Sewer, Cleveland, O.,—3-4 YdH.eavy Bucket being used

Perforated Metal Screens
FOR
Stone, Gravel, Sand, Etc.



ELEVATOR BUCKETS
PLAIN AND PERFORATED
General Sheet and Light Structural Work
Hendrick Mfg. Co.
CARBONDALE, PA.
New York Office, 30 Church Street

Many Notable Improvements Characterize THE "American" Gearless Blast-Hole Drill

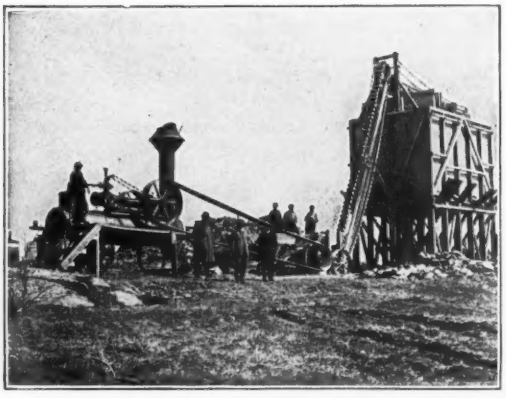
While the normal speed of drilling is 50 strokes a minute, this machine will jump the tools smoothly at 60 strokes, handling with ease a 4-in. diameter by 20-ft. length drill stem equipped with bit and socket weighing from 1100 to 1200 lbs. and drilling 5⅝-in. or 6-in. holes.

The spudding beam is attached to the crank in such manner that it gives a quick, hard stroke of drill at a speed of 50 or 60 r. p. m., with a minimum of whipping of cable.

No clutches on the machine; the crank is keyed fast to the crank shaft, and the tools are always the full length of the stroke off the bottom when stopping, permitting them to start on the down stroke with engine or motor at full speed without backing up.

Description on Request

The American Well Works Aurora, Illinois



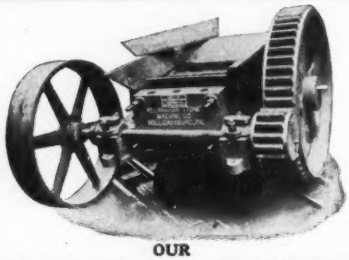
COMPLETE INSTALLATIONS
For Stone Quarries or Lime Plants

We are prepared to build and superintend the installation of all equipment necessary to start operations.

Reliance Products are equal to the best and we know that our engineers can save you money by their recommendations. Prompt deliveries.

Let Us Quote You Prices

Universal Road Machinery Co.
Kingston, N. Y.
Reliance Quarry and Road Building Equipment



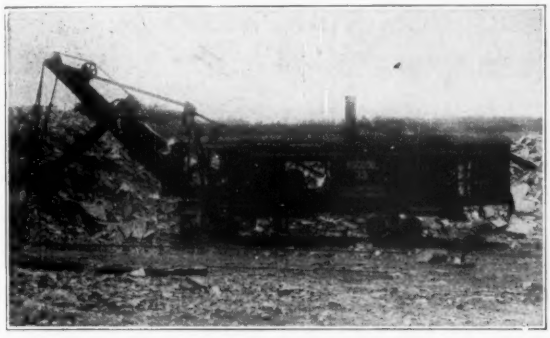
OUR
SINGLE ROLL CRUSHER
is as simple as can be. Is easily fed, makes less fines than either a Gyratory or Jaw. Capacity 5 to 500 tons per hour. For crushing Limestone, Dolomite, Hard Rock Phosphate, Cinders, etc. Screens of all descriptions. Washers for dirty stone.
Ask for Information
McLANAHAN-STONE MACHINE CO., Hollidaysburg, Pa.

When in the market for machinery or equipment, look through the advertisements of ROCK PRODUCTS. If you do not find what you want advertised in this issue, write us and we will put you in touch with reliable firms who can supply your need. This service is free to our readers. Use it.

Rock Products
The Nation's Business Magazine of the Rock Products Industry
542 So. Dearborn St. Chicago, Illinois

Conveyor, Loading, Steam Shovel, Dredge, Crane, Quarry and Hoisting Chain

UNITED STATES CHAIN & FORGING COMPANY
Union Arcade *"As Good as the Name"* Pittsburgh, Pa.



Osgood-73, in Heavy Quarry Work

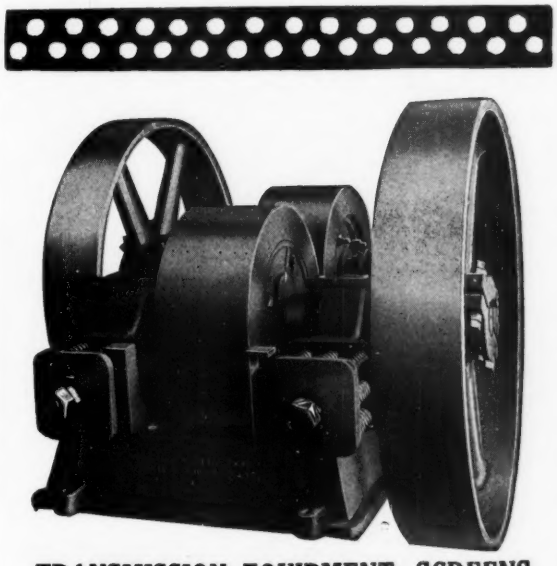
THE OSGOOD 73—3½ yard steam shovel is designed throughout for the heaviest kind of service. It meets demands where maximum strength is required and severe work to be done, such as found in iron mines, rock works, etc.

It has all the features in good steam shovel construction which embody steel gears with machine cut teeth; manganese racks and pinions for dipper handle; cast steel swinging circle; heavy front end construction; especially strong boom; large boiler and water tanks; long car frame; enclosed firing platform; steam hoisting friction; by-pass throttle, etc.

We will take pleasure in furnishing you on request complete information on any of the different size shovels we build, which range from ¾ to 6 cubic yard capacity

Write today for copy of our New General Catalog C-1

THE OSGOOD COMPANY, Marion, Ohio



TRANSMISSION EQUIPMENT, SCREENS ELEVATOR BUCKETS, CRUSHERS

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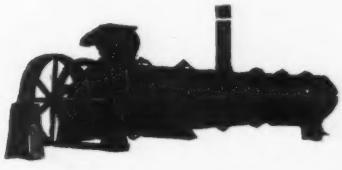
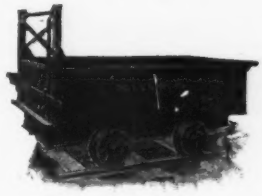
WEBB CITY & CARTERVILLE FOUNDRY & MACHINE WORKS
WEBB CITY, MISSOURI



Lime Hydrators, Kilns, Calcining and Quarry Cars



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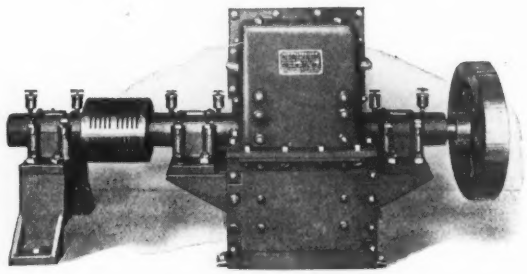

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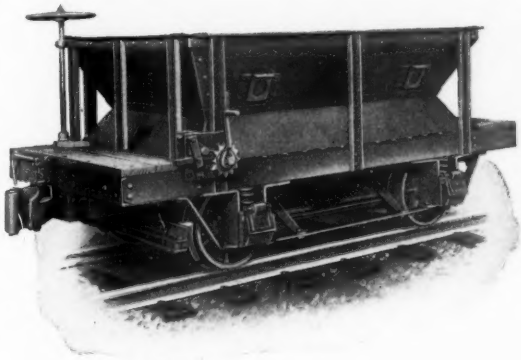

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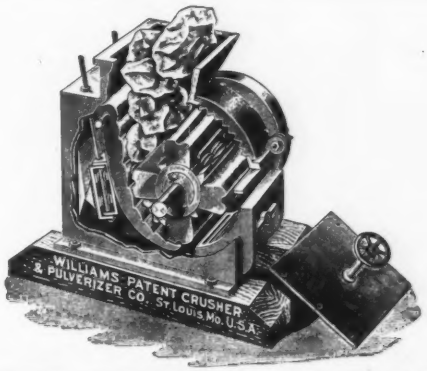

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will take Limestone, Lime, Gypsum or Gravel in cubes 14"x16" and under, depending on size of crusher, and in one operation reduce same to 2", 1", 3/4", 1/2", 1/4" or finer. Capacities range from 1 1/2 to 40 tons per hour. Noteworthy features are: Low Horse Power, Slow Speed, High Capacities, Small Floor Space and Instantaneous Adjustment for Different Sized Products. Complete information in Bulletin 4-213.

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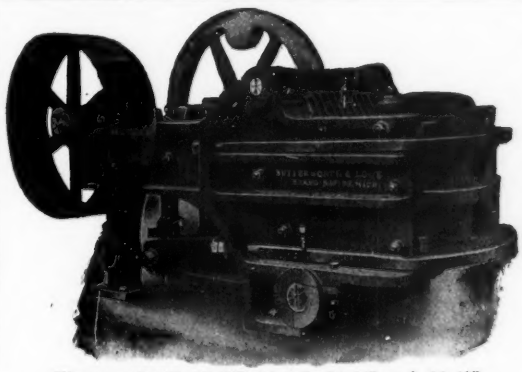

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20" to 47" inside diameter. Many variations

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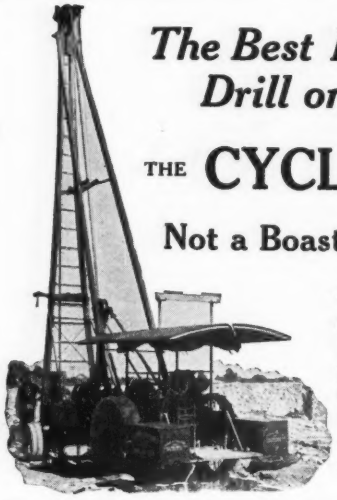

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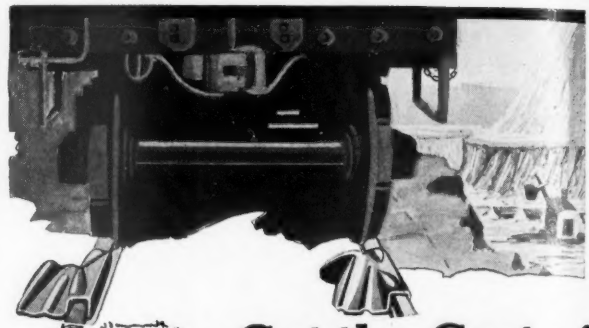

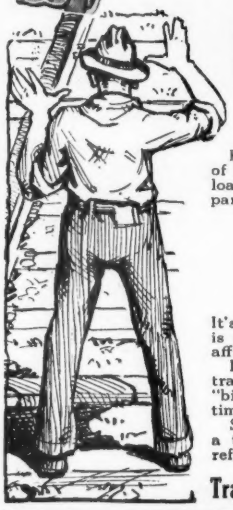

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It's plain as "two and two is four." The cost is so much less to be prepared that you can't afford to be without a set another day.

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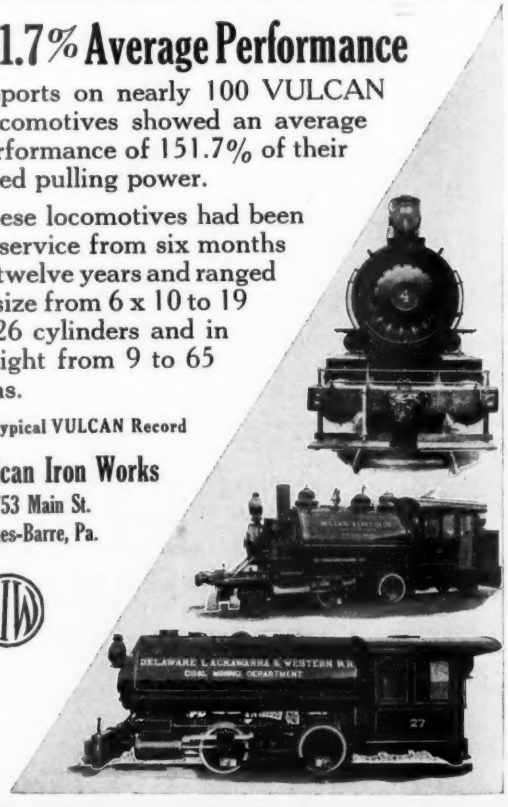

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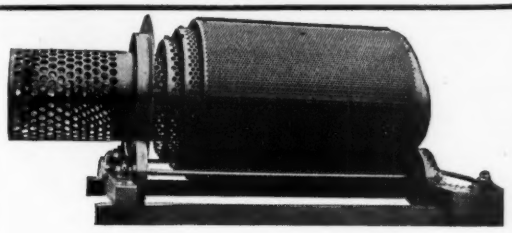

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"Our ERIE Steam-Shovel has worked steadily without a minute's trouble or a single breakdown. We have loaded about 2600 fifty-ton cars with this shovel, and it is just as good today as the day we received it.

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For trench and cellar digging; road grading and crane service (with steel boom).

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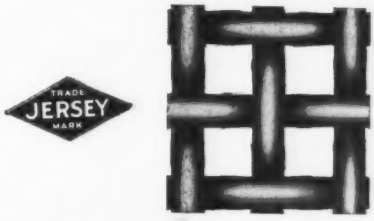

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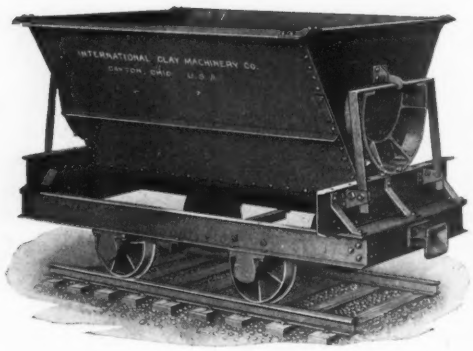

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For carrying cement, lime, crushed stone, it is without an equal. Made of highest class duck of uniform weave. Has strength of 500 lbs. to the square inch, is folded by hand, ply by ply, under the most rigid inspection. Even thickness, uniform weight, strength and lasting service are assured users of Hettrick Red Stitched Canvas Belting.

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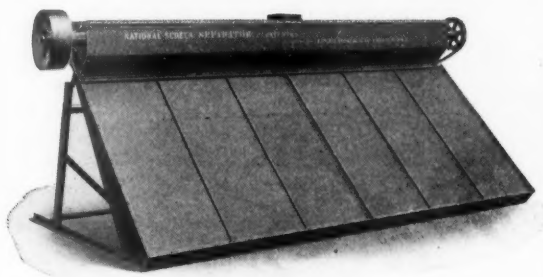

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For well drill blasting and the tunnel and pocket method of blasting, where large quantities of explosive are to be detonated, use safe, efficient Cordeau-Bickford and get lower blasting costs.

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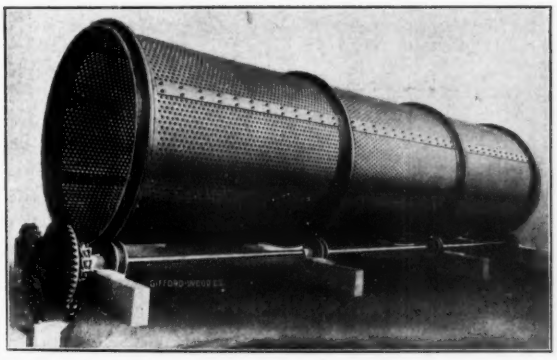
Established 1836 **Original Makers of Safety Fuse**



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Reduces lump rock to 20, 40, 60, 80, 100 or 200 mesh. Requires no outside accessory equipment. Requires no overhead shafts, drives or screens. All material discharged from mill is finished product. No inside journals or bearings. No inside lubrication. Uniform feeding system. Constant and free discharge. Low installation cost. Low operating cost. Low lubricating cost. Dustless operation. Built in sizes to meet the requirements of your trade. Grinds rock to meet the specifications of all Agricultural Experiment Stations.

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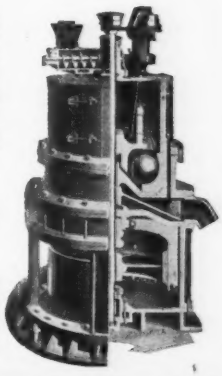

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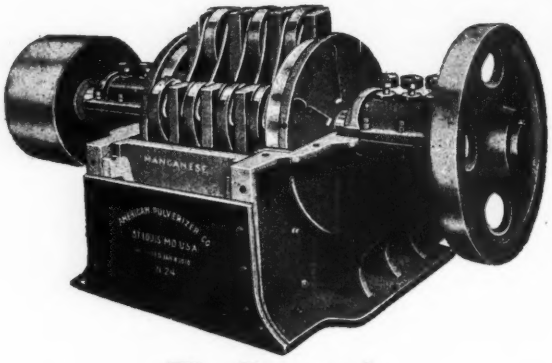

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When the curve of Limestone production shows a big increase you can mark it down as a fact, it's Pulverizing Machine efficiency. Right here is where the American Ring Pulverizer has made a record.

It is built simple, and strong, for heavy, dependable, rugged service.

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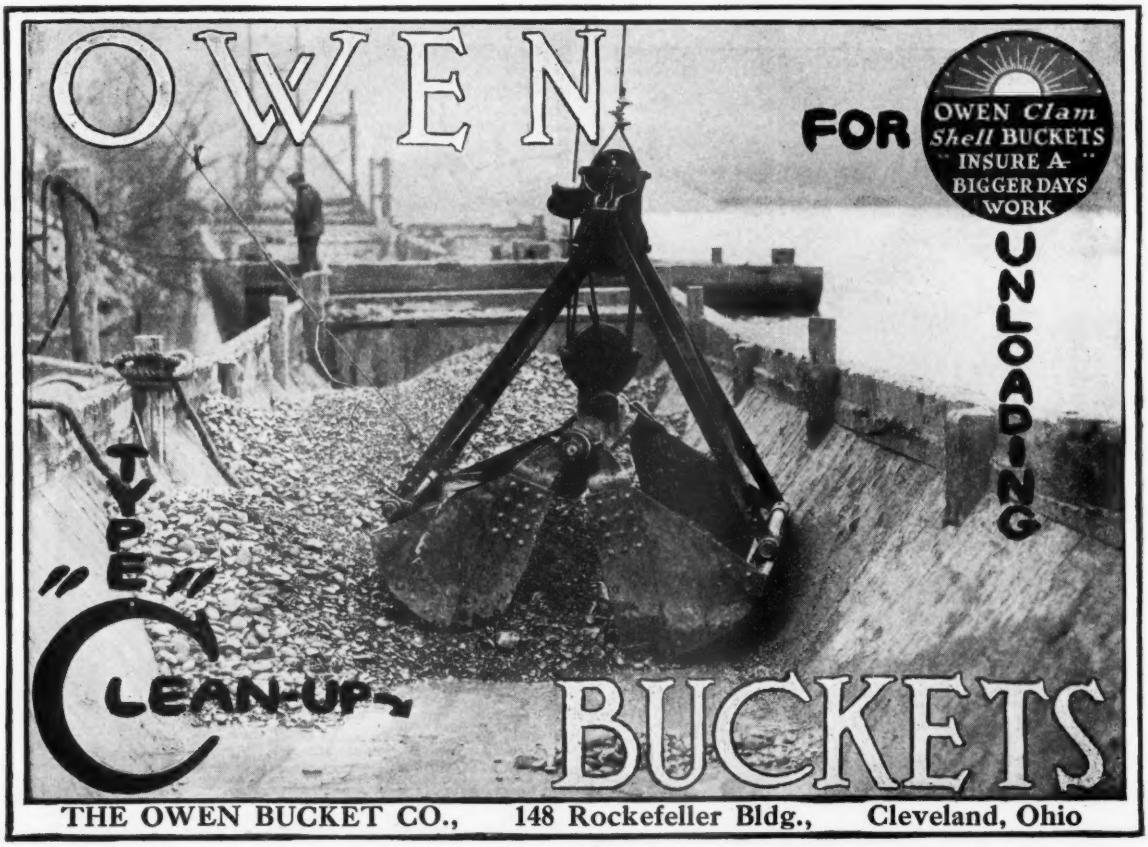

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Average Efficiency 95%.

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These tests were conducted by an entirely disinterested company under the supervision of an expert and under varied conditions, with a feed of coal and coke. They proved these important points:

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2. **It handles a larger tonnage per hour than any other screen.**
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We shall be glad to give you full information as to the conditions under which these tests were made, and also details of other records made by the Mitchell in actual operation.

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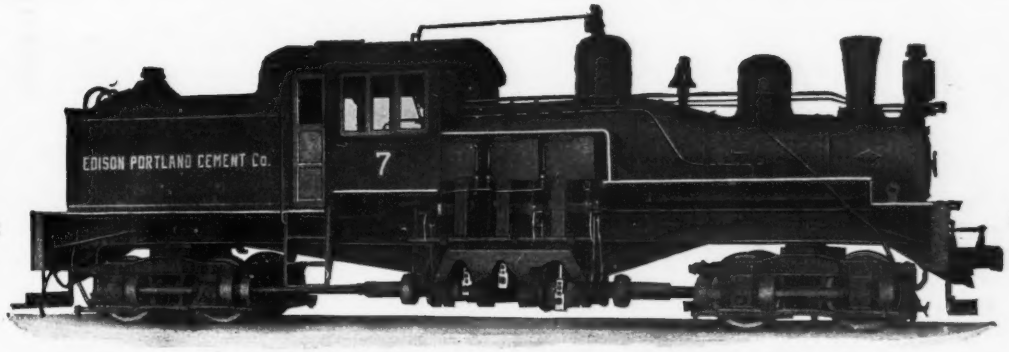

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The kind of service they give is the kind that produces largest net profits.

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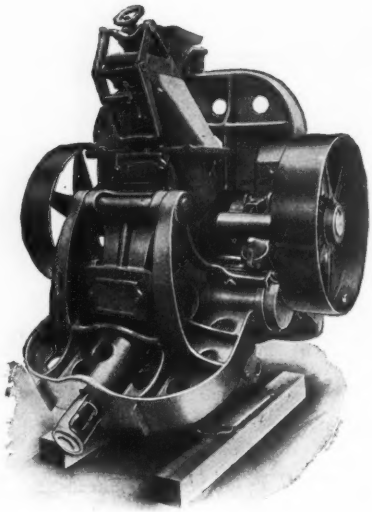

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LIMESTONE ..... 20 to 40 Mesh
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The UNIT that has LARGER OUTPUT with LESS POWER WEAR and ATTENTION than any other.

It will be to the interest of those who operate CEMENT PLANTS to know what the Maxecon Unit will do.

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All requirements, both practical and theoretical, are met in the Morris construction. Our experience covers all service to which pumps are put.

We have an unequaled record of accomplishments in turning out all sizes of pumps, including the very largest.

We gladly make suggestions on receipt of details of your proposition. Have you our Bulletin 15? It is full of useful information. Write for it today.

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Labor Saving Machinery

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—Put Your Equipment Problem Up to Us—
A staff of efficient engineers will help you and advise the equipment that will give you the best service

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SCHAFFER
Continuous Lime Hydrators

AUTOMATIC operation delivers lime by **weight,** not volume, to the Schaffer Hydrator. Automatically, water, too, is added in correct proportion—insuring a continuous flow of a superior product.

The flexibility of control enables the use of either high calcium or dolomite lime, while at the same time the automatic operation of Schaffer Hydrators solves the labor problem, as they require but little attention.

Our literature on the Schaffer Hydrator covers all the questions you now have in mind. Write for it at once!

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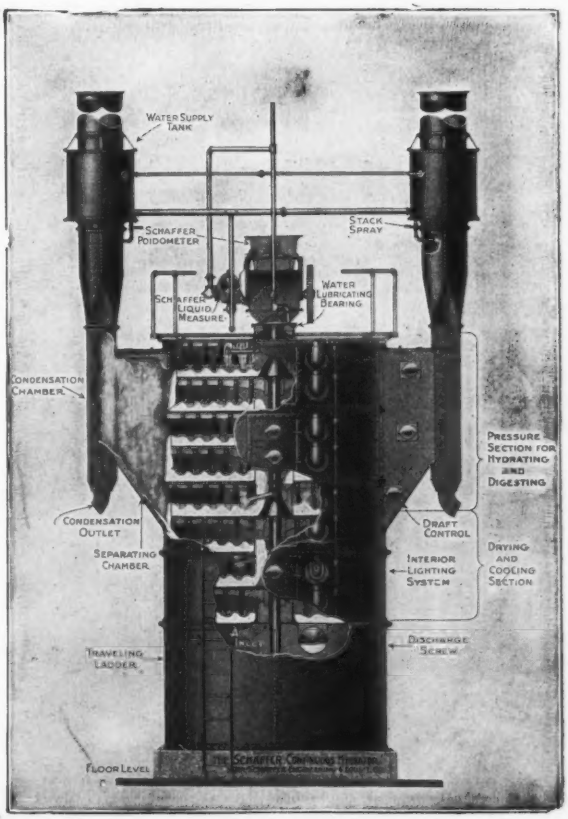

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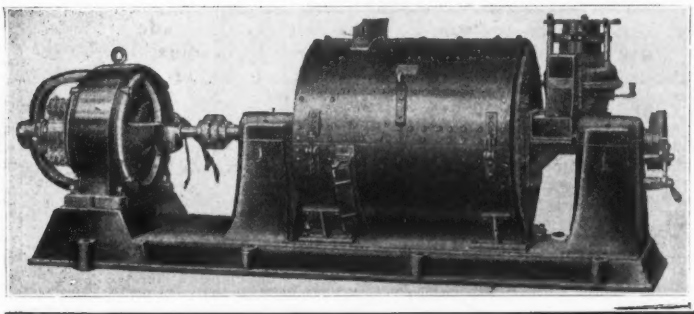
The AERO PULVERIZER



is designed as a complete unit for one furnace. They are built in five standard sizes ranging in capacity from 600 lbs. to 5,000 lbs. of coal per hour. Dust-proof and strongly built. All parts susceptible to wear are easy of access.

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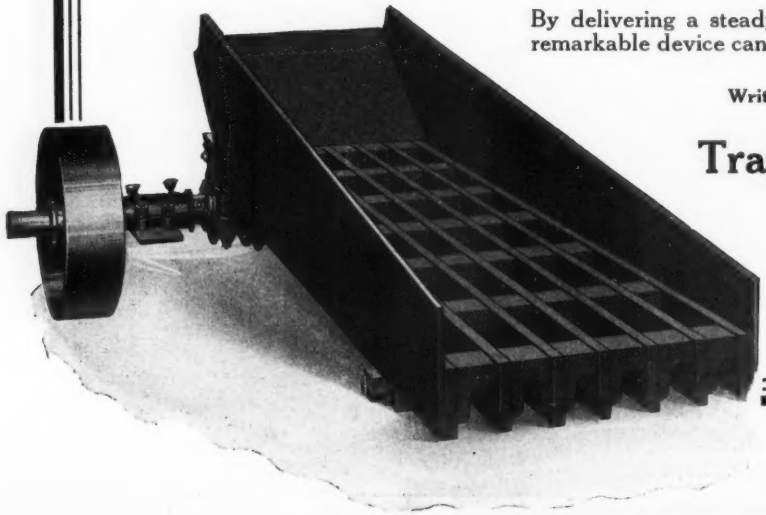
50 Per Cent Increased Capacity

—and with the same crushers—a big economy recently effected in one of the world's largest gravel crushing plants, by the installation of a

Traylor "Bulldog" Feeder



By delivering a steady, even feed, minus the fines, this remarkable device can be a real builder of profits for you.

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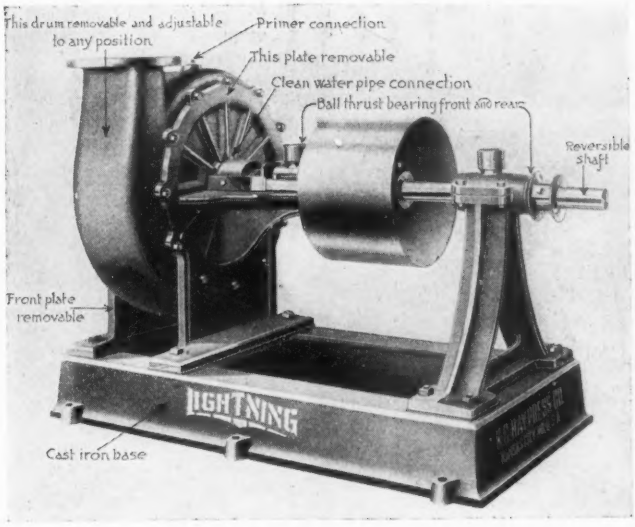
The Lightning Sand Pump



The ideal pump for sand companies and contractors—easy to operate, easy to adjust, easy to replace parts.

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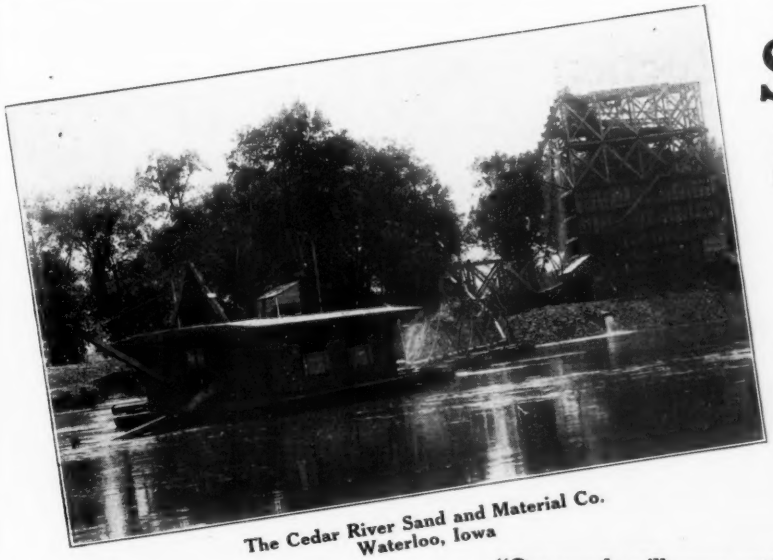

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Especially built for sand and gravel suction. Cylinder bore throughout with internal diameter to fit snugly over standard pipe of corresponding size. Built oversize.

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of high grade lime by heating your kilns with producer gas generated in

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They deliver a constant supply of high quality gas, thus insuring a uniform temperature in the kiln. This uniform supply of high quality gas burns with a long, clear flame which resembles the flame from a wood fire. The result is a greater production of first grade lime.

The Chapman Floating Agitator will increase the capacity and the efficiency of hand-poked producers already in operation.

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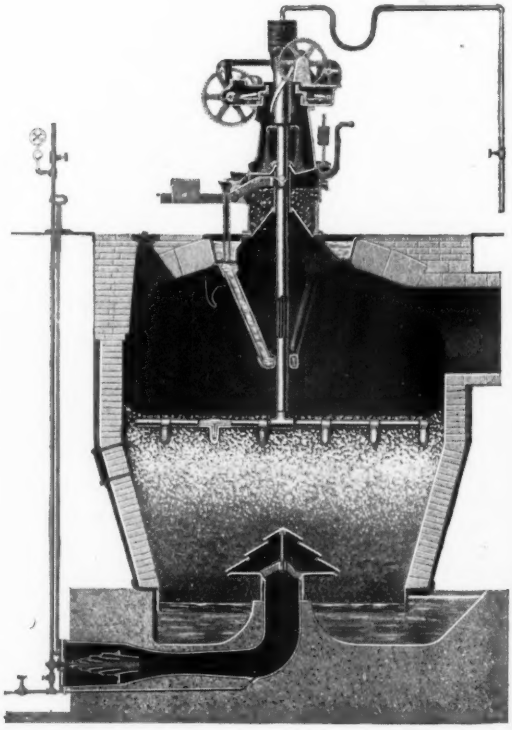

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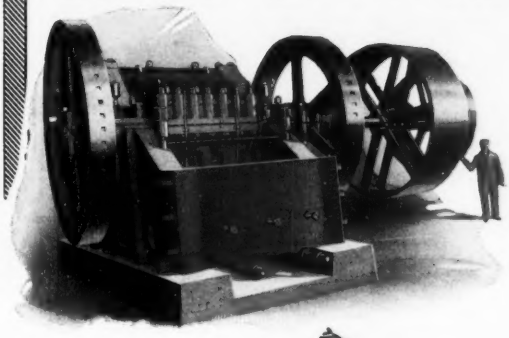

The figures show two general designs built for preliminary crushing. Made in standard sizes 60x84″, 48x72″, 48x60″, 42x72″, 42x60″, and 42x54″.

On the hardest rock or ore these machines will make a six-to-one reduction. That is, the size 60x84″ will receive rock measuring approximately 60″ in thickness and will reduce same to 10″ and under, with the usual amount of fine material. The other sizes reduce in the same ratio, according to their respective sizes, and the quality of material.

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Crushing Machinery, Crushing Rolls and Magnetic Separators

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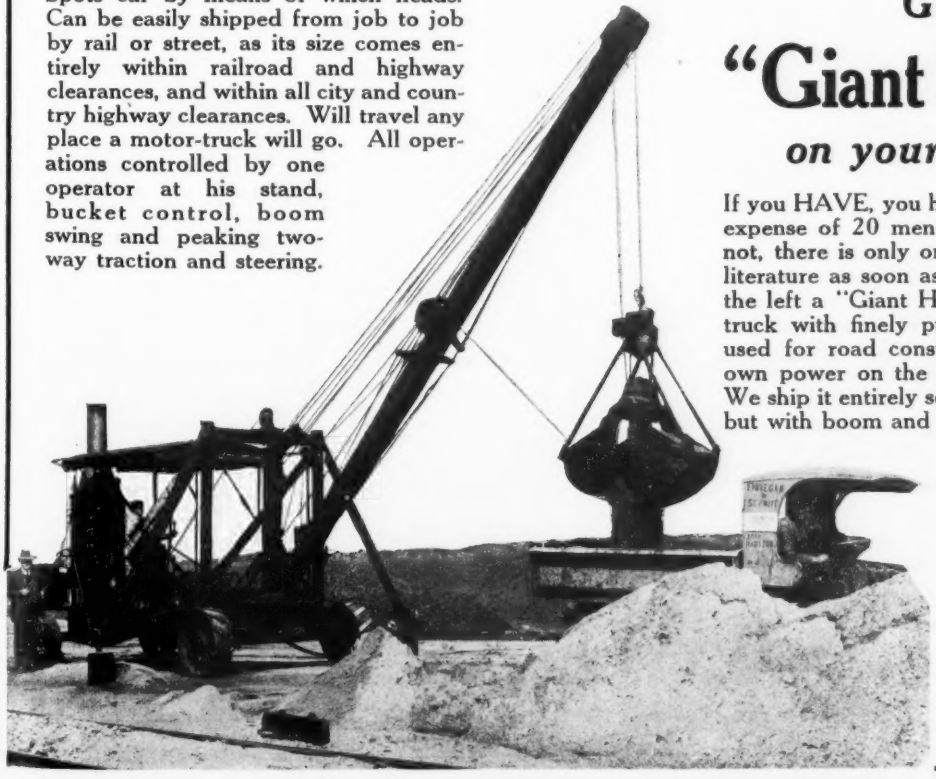

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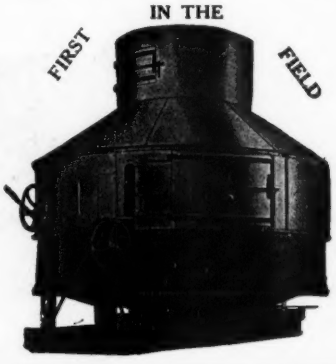

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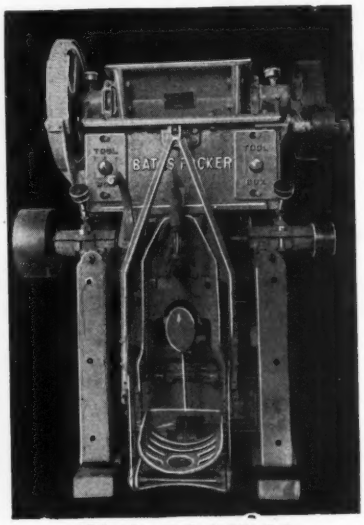

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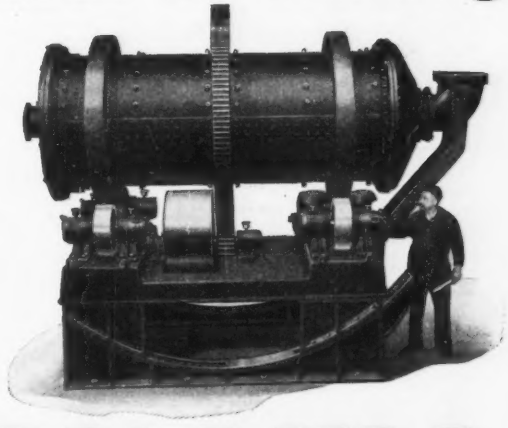

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S-A sand and gravel plants are designed to produce a washed product thoroly cleaned and screened to size. There are certain fundamental principles involved in the S-A gravel plant design which insure superior results. Our engineers are glad to co-operate in the preparation of layouts for a new project and there is no charge for this service.

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The Bradley Hercules Mill

Built for the Preliminary Pulverizing of Cement Materials

In Operation at the Largest and Most Successful Cement Plants Since 1913—More Popular Than Ever and More Successful

13 Mills Sold to Pennsylvania Manufacturers
Other Installations in Tennessee—New York—North Carolina—Illinois—Oklahoma—California—Washington—Cuba—Argentine

It's the largest preliminary machine manufactured adapted for pulverizing Cement Rock, Limestone or Clinker.

One manufacturer with two mills ground 170,000 barrels Clinker in one month—another manufacturer has averaged 40 tons per hour, when grinding Limestone over a period of several years of operation.

It's a Wonderful Labor and Power Saver

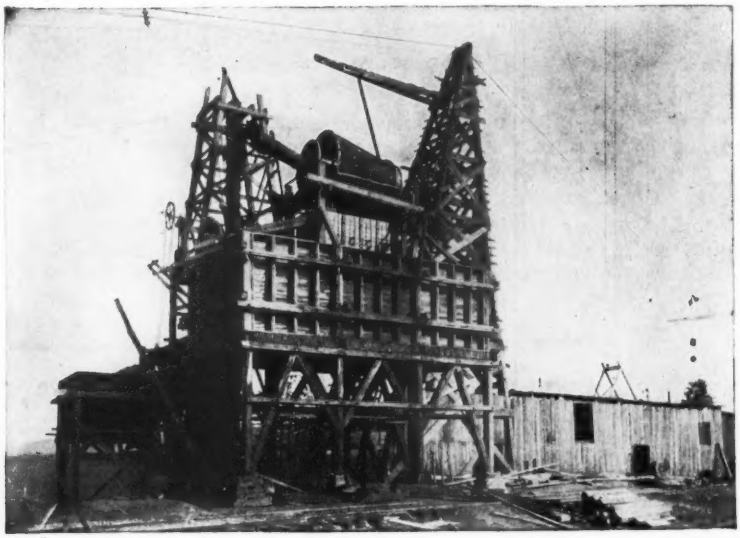
Our Engineers will gladly show you how this mill will reduce your present operating costs, using your present tube mill equipment, and increase your output.

BRADLEY PULVERIZER COMPANY

Works: Allentown, Pa. **BOSTON, MASS.**

Manufacturers of Pulverizing Machinery for 30 Years

Call in a WEBSTER man and get his recommendations on Sand and Gravel Plants



The Webster Cyl-Cone Screen permits a particularly economical arrangement and construction for a plant to make three or more size separations.

It is the business of Webster engineers to know the best way to install sand and gravel plant equipment to meet your needs.

They know what type of equipment will give the greatest service at the least initial cost, at the lowest operating cost — under your particular conditions.

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Of this be assured:—We build practically every type of equipment and so have no favorites to play. Your information and a request for plans will bring impartial recommendations, without obligation.

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Sand and Gravel Plant Machinery, Screens, Conveyors, Feeders, Drives, Friction Clutches, Etc., Etc.

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SPELTER
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EXPLOSIVES
Chemically
Perfect Explosives
Mean Perfect Blasting
Every shot you place, every blast you make, has a certain work to perform — a certain assigned quantity of material to carve out.
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But they will not do their assigned work
—unless the explosives used are chemically right.
—unless the chemicals used in their manufacture are perfect by proof, best by test.
The Grasselli Powder Company uses only "Grasselli" Perfect Chemicals—made since 1839 by the master chemists of the Grasselli Chemical Company, America's oldest and largest chemical manufacturers.
Let "Grasselli" service experts help you solve your blasting problems. Years of experience in handling shots in pit and quarry operations, together with their superior knowledge of the actions of various grades of explosives places them in position to be of real service to you. Let them help you cut operating costs and increase your output. A letter or wire will bring one of them to your quarry.
The Grasselli Power Co.
CLEVELAND, OHIO
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